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Original Communications.

Trial for Murder by Poisoning with Arsenic.—Discovery of the Poison after Seventeen Months. By T. G. WORMLEY, M. D.

At the term of Court held by Judge Evans at Zanesville, Muskingum county, Ohio, in June last, Mrs. Cloe Ann Culbertson was tried for the murder of her husband, John Culbertson, by poisoning with arsenic. Judge Marsh and John Haynes appeared as counsel for the State; Messrs. Blocksom and Guille for the prisoner.

It appeared in evidence, that the deceased was in the 70th year of his age, and that he had been in ill health for several years prior to his death, which occurred on Wednesday, October 9th, 1861. The symptoms attending his death were very obscure. When examined by his physician on the previous Friday, he complained of flying pains throughout the body, dizziness, thirst, constipation, and that his feet were swollen. He was ordered a cathartic of cream of tartar and jalap. His symptoms continued without any marked change, so far as appeared in evidence, until Wednesday morning, when he expressed himself much better and desired to get up and eat his breakfast, but upon the advice of his physician he remained in bed. About noon Mrs. Culbertson and another woman entered his room to give him some soup which

they had prepared, when he stated that he desired to get up to stool, upon which they left the room. After a few minutes they heard him fall, and upon immediately entering his room found him dead upon the floor several feet from the bed. He had deposited a portion of the contents of his bowels near the bed and over the floor to the place at which he lay, but had not reached the chamber, which was about seven feet from the bed.

At the time, his death caused no suspicion whatever, but was pronounced to be due to apoplexy. No attention was directed to the case until early in March, 1863, when, during a state of intoxication, Mrs. Culbertson confessed to a servant girl, who had just come into her family and who was entirely ignorant of the circumstances attending Culbertson's death, that a man, who was a tenant upon a portion of their farm, had procured her some arsenic, which she administered to her husband at three different times; the first dose caused him to swell, the second to swell more, and the third killed him. At a subsequent investigation of the case, there was a failure to show that the person charged had obtained any poison, but it was shown that Mrs. Culbertson, several weeks prior to her husband's death, had obtained about half an ounce of arsenic for the alleged purpose of killing rats.

On the 9th of March John Haynes, Esq., Prosecuting Attorney for the County, instituted a *post mortem* examination of the body of Culbertson, which was performed in chief by Dr. D. Day of Zanesville, to whom I am indebted for the following account of the appearances of the body, which is substantially the same as that given at the trial.

Upon removing the earth, it was discovered that the vault contained some four inches of water. The vault was cut in a stratum of soap-stone shale, which laid four feet below the surface, and was favorable for containing water in much larger quantities. The coffin was sound and made of black walnut; the clothing was saturated with water; there was no fetor, the only smell being of musty, moist cloth; the features and soft parts of the throat were gone or converted into a dark greasy material. Upon removing

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the arms from the breast, the bones of the hands dropped off and the elbow joints broke assunder. The bones of the feet had also fallen, and the flesh on both extremities had given place to a dark unctuous matter. Upon opening the clothes, the sternum fell into the cavity of the thorax, which was occupied only by the saponaceous debris of the thoracic organs, diaphragm and intercostal muscles. The abdominal walls were in a surprising state of preservation, of the color of old parchment, and well attached to the pubis, crest of the ilium and lumbar region, but flattened against the forward curve of the vertebral column and sparingly attached at the costal portion. Upon making the incisions, the integuments were firm, and the muscles were of a pink hue but very attenuated. The omentum was large and in place and covered with saponaceous matter. The stomach and intestines were pale, comparatively dry and appeared as though the convolutions had been pressed together; they were very firm and allowed free manipulation. The alimentary canal was removed from the middle of the œsophagus to the lower portion of the rectum. The odor exhaled at this time was very peculiar though not disagreeable. The pancreas and spleen looked remarkably recent, as did the liver, though this organ was much diminished in size. The posterier walls of the abdomen, the mesentery and kidneys, were well preserved. The genital organs were destroyed, though the bladder was in a very good state of preservation.

On the 11th of March the above abdominal organs, carefully sealed in a clean glass jar, were delivered to me for a chemical examination. Three separate examinations were made.

1. *The Stomach.*—This organ formed a flattened mass with the sides somewhat adherent, and contained a small quantity of dark colored solid substance. The tissue was tough and appeared recent. The mass, after cutting into very small pieces, was mixed with eight ounces of distilled water and two ounces of pure hydrochloric acid and moderately heated for about two hours when it had become a homogeneous mixture. After allowing it to stand for about one hour the mixture was strained through muslin, and

the reddish brown liquid concentrated at a moderate temperature, to three fluid ounces.

a. About one fluid dram of this liquid, acidified with a few drops of pure, hydrochloric acid, was boiled for a few minutes with a piece of bright copper foil, about one-fourth inch long by one tenth inch wide, when the metal received a very good steel-like coating. The copper was then removed, washed, dried and heated in a small contracted reduction tube, similar to those described by me for the detection of mercury by the copper test, (London Chemical News, Oct. 1860, p. 194,) when it furnished a just perceptible sublimate which under the microscope was found to consist of innumerable octahedral crystals of arsenious acid.

b. About seven drams of the liquid, acidified with hydrochloric acid, were now mixed with the above liquid, and the mixture boiled with consecutive slips of copper foil, one inch by one-tenth inch, until twenty pieces had been added. These were all coated with a steel-like deposit. A few of these slips, when cut into small pieces and heated in a small reduction tube, furnished a very satisfactory sublimate of crystals of arsenious acid. Although these reactions, and others not detailed above, showed conclusively the presence of arsenic, yet they indicated that it was present only in small quantity.

c. The remaining two ounces of liquid obtained from the stomach, were now diluted with a few ounces of distilled water, acidified with hydrochloric acid, and then exposed to a stream of washed sulphuretted hydrogen gas for several hours. This yielded a distinct precipitate, which after allowing the mixture to stand in a moderately warm place for about eighteen hours, subsided to a quite good deposit having a dirty brown color. The mixture was now filtered through paper, the filter washed with a small quantity of water containing sulphuretted hydrogen, and the moist residue washed with diluted ammonia. This filtered ammoniacal liquid was then evaporated to dryness in a porcelain dish, the residue treated with a few drops of concentrated nitric acid, and the mixture evaporated to dryness at a moderate heat. This opera-

tion with nitric acid was repeated a second and third time, when it left a yellowish residue. This was treated with a few drops of concentrated solution of caustic soda, the liquid evaporated, and the residue fused with a small quantity of a mixture of carbonate and nitrate of soda. Having thus entirely destroyed the organic matter and changed the sulphuret of arsenic into arsenic acid, which remained as arsenate of soda, the mass was dissolved in a small quantity of water, strongly acidified with pure sulphuric acid, and the mixture evaporated until it evolved dense fumes of sulphuric acid, by which any nitric and nitrous acids present were expelled. The residue was then dissolved in a few drams of pure water and the colorless solution saturated with sulphurous acid gas. After allowing the mixture to stand for a few hours the excess of gas was expelled by a gentle heat, and the liquid evaporated to two drams of fluid.

Marsh's Test.—One dram of this solution was consumed in the application of Marsh's test, using an apparatus containing less than a fluid ounce of dilute sulphuric acid. From the ignited jet it furnished several very good deposits of metallic arsenic; upon heating the horizontal portion of the reduction tube, it yielded a very good deposit of the metal. The true arsenical nature of these deposits was fully confirmed by subsequent reactions.

Reinsch's test, applied to about half of the remaining fluid, gave very satisfactory evidence of the presence of the poison.

Sulphuretted hydrogen, when passed into the remaining liquid, yielded after a very little time a distinct turbidity, which, after a time, subsided to a distinct yellow deposit.

In a chemical point of view, the presence of arsenic in the stomach was fully established by the experiment *a*, yet for medico-legal purposes it is always best, when there is sufficient material on hand, to apply several tests, and thus show the presence of the poison by different methods, each independent of the other. Although there was sufficient poison present to indicate its presence conclusively by each of the above methods, yet after a very care-

ful estimate we concluded that the absolute amount present did not vary much from the twentieth part of a grain.

2. *The Liver.*—This organ, which was in a quite good state of preservation, was cut into small pieces and digested at a moderate heat for a few hours with about fifteen ounces of distilled water, containing one-fifth of its volume of pure hydrochloric acid. After allowing the mixture to stand for a few hours it was strained, the strained liquid concentrated to a small volume, allowed to cool, and again strained. The clear brownish-red liquid thus obtained was then examined by the copper test for arsenic, when it furnished several very distinct sublimates of arsenious acid. Although the quantity of poison recovered was extremely small, yet its presence was unequivocally demonstrated. A few of these sublimates contained a number of mercury globules. We could not learn that the deceased had taken any mercury shortly prior to his death.

The small quantity of arsenic present in the liver precluded the application of any of the other tests. The reduction tubes used in the above experiments were of the form already referred to. Had we used any other it is almost certain that the poison would have escaped detection.

3. *The Intestines, Spleen, Pancreas and Mesentery.*—Having shown the presence of the poison in the stomach, and that it had been absorbed and entered the liver, and on account of the very offensive nature of the remaining organs, these were examined together. For this purpose they were cut into small pieces and digested with distilled water and hydrochloric acid, much in the same manner as described in the preparation of the stomach. Four fluid ounces of residual liquid were obtained.

Two fluid drams of this liquid, diluted with water and acidified with hydrochloric acid, were examined with a few inches of copper foil; the foil very promptly received a steel-like coating. The coated copper being washed, dried, and heated in an ordinary reduction tube, yielded a sublimate of crystals of arsenious acid quite satisfactory to the naked eye. This operation was repeated

upon the same liquid until it furnished about twenty inches of coated copper.

The poison was now precipitated from the remaining liquid by sulphuretted hydrogen, and the sulphuret of arsenic thus obtained, freed from organic matter by ammonia, nitric acid, etc., in the manner described, when considering the purification of the sulphuret from the stomach. The ultimate solution obtained measured three fluid drams.

Fifteen grain measures of this liquid, when examined in two separate portions in a small Marsh's apparatus, furnished from the ignited jet quite a number of deposits, and by heating the reduction tube two extremely fine deposits of metallic arsenic.

Five grains of the solution, when diluted and submitted to the copper test, furnished several magnificent sublimates of crystallized arsenious acid.

The remaining fluid was then treated with sulphuretted hydrogen. The pure sulphuret of arsenic thus obtained indicated the presence of one-sixth of a grain of arsenious acid. During the examination of the organs now under consideration a number of confirmatory tests were applied, which are not referred to above.

From the fact that the amount of poison actually recovered from the body was less than has heretofore been known to have destroyed life, it was urged at the trial that the evidence of poisoning was defective. When we consider the many ways in which a poison may escape, even from a recent body, and that in no instance are our chemical methods absolute, the absurdity of this objection is too apparent to require argument; yet it is a singular fact that there is scarcely a trial for murder by poisoning in which it is not brought forth. It would be about as reasonable to contend that a person who had died from the bite of a venomous serpent had not died from the effects of a poison, because, as yet, chemistry was unable to reveal the presence of the poison in the system.

After an absence of a few hours, the jury returned a verdict of guilty of murder in the second degree.

Columbus, O., Oct., 1863.

Chase General Hospital,
CAMP CHASE, OHIO, Oct. 7th, 1863.

DR. JOHN DAWSON,

Editor Ohio Medical and Surgical Journal:

DEAR SIR,—I herewith send you a copy of Orders emanating from the office of the Surgeon General U. S. A., in relation to impure vaccine virus used in this Hospital, and also my report thereon. I send you this Order and Report, not because of any great professional interest they may contain, but merely to show the professional public the rigid scrutiny constantly exercised by the head of the Medical Department of the Army.

Very respectfully yours, etc.,

R. N. BARR,

Surg. in charge U. S. Gen. Hospital, Camp Chase, Ohio.

Extract from Report of Inspector of the Chase U. S. Gen. Hospital near Columbus, O., July 18, 1863, by Lt. Col. S. Humphries, Medical Inspector U. S. A.

* * * * * * *

Diseases prevention of, none at present. Vaccine virus heretofore in use impure, often producing ulcers.

* * * * * * *

A true extract. B. E. FRYER,
Ass't Surg. Gen'l, U. S. A.

Respectfully referred to the Medical Director of the Department of the Ohio, who will investigate the source from which the within mentioned vaccine virus was obtained, and prevent its further issue.

By order of the Act. Ass't Surg. Gen'l:

B. E. FRYER.

A. S. G. OFFICE, Aug. 8, 1863.

Medical Director's Office, Department of the Ohio,
CINCINNATI, O., Aug. 12, 1863.

Please report upon the subject of the inclosed papers, and return the report with the documents to this office.

Respectfully,

J. T. CARPENTER,
Surg. U.S.V., Ass't Med. Director.

DAVID STANTON,
Surg. U.S.V., Supt. Hospitals Columbus, Ohio.

Office Supt. Hospitals,
COLUMBUS, O., Aug. 13, 1863.

Respectfully referred to R. N. Barr, Surg. in charge Chase U. S. Gen'l Hospital, who will report on the inclosed papers, returning all papers to this office.

Please send history of private George Noice, of Capt. Neil's Independent Battery of O. V., who died in Hospital. Find out, if possible, where the impure virus came from.

Very respectfully,

D. STANTON,
Surg. and Supt. Hospitals.

Chase General Hospital,
CAMP CHASE, OHIO, Aug. 12, 1863.

D. STANTON, U.S.A.,
Surg. and Supt. Hospitals, Columbus, Ohio:

Sir,—In relation to the inclosed order, I have the honor to report, through you, that on careful investigation, I learn that the impure virus alluded to by Lt. Col. S. Humphries, Medical Inspector U.S.A., in his report, was obtained from a paroled soldier, brought to this camp from Lagrange, Tenn., early in April last. I cannot trace the origin of the virus further back, nor the character or dia-

thesis of the soldier importing it to this camp. As nearly as I can ascertain, seventeen of the inmates of this Hospital were inoculated from this virus without the knowledge of the Surgeon then in charge, or any medical officer then in the Hospital. The men vaccinated themselves, from the virus obtained as above stated. In two of them no effect whatever was produced; in fourteen, it resulted in large sloughing ulcers, resembling very nearly the phagedenic chancre, and attended with well marked constitutional depression, and requiring in all cases tonics, and in some cases stimulants. In most of the cases a healthy granulation was established, in periods of from two to four weeks, without other treatment than an occasional aperient, with tonics and slightly stimulating poultices. In three instances (the cases being at the time under my immediate charge), in order to arrest the progress of the sloughing process, I cauterized them thoroughly with nitric acid, and after the escar came off, used topically an aqueous solution of bromine, of twenty minims of the officinal strength to the pint of water. With one exception, under this treatment, they all finally recovered. In a few cases, still under my observation, no symptoms of secondary syphilis, or other constitutional defects, have appeared.

One case, in the person of George W. Noice, private of Captain Neil's 22d Ohio Vol. Independent Battery, I deem of sufficient professional interest to report in detail. This soldier entered the Hospital June 22d, 1863, laboring under an acute attack of orchitis a metastasis of parotitis. While making my morning visits, on the second day after his admission to the Hospital, he called my attention to his left arm, on which was an ulcer, over the region of the insertion of the deltoid muscle, about twice the size of a silver dollar. I also found the lymphatic glands in the axilla much inflamed and swollen, and that pus had formed.

On inquiry, I learned that he had vaccinated himself from the virus, already spoken of in this report, about two weeks previous to his admission in this hospital; that four days after vaccination, a

pustule appeared at the point of insertion of the virus; that soon after his arm began to swell and be painful, and the pustule assumed the appearance of an ulcer; no scab having formed, and that about the same time, that is, on the fourth or fifth day, the swelling in the axillary space commenced. I immediately anticipated trouble. My patient was of delicate constitution; imperfect in general development (æt. 20 years). His mother had died of phthisis pulmonalis. Countenance anxious; pulse 100 per minute. Considering the orchitis a small matter, I applied simply a lotion of plumbi acetas to the swollen testes, lanced the abscess in the axilla, and put him on the following: ℞, tinct. ferri. murias, gtt. x, at 6 A. M., 12 M., and 6 P. M.; pulv. Doveri at 9 P. M. Diet, beef-tea ad libitum, with local application to ulcer of yeast poultice. I continued this prescription daily for a week, maintaining pretty well the strength of my patient; but the phagedena was gradually increasing in dimension, and assuming the form of a serpiginous chancre; the edges of the sore became thin, livid and œdematous, and turned back upon the sound skin, like a flap; the axilla slowly granulating. July 1st. Pulse 118, tongue tremulous, brown, and slightly crusted in the center. ℞, sul. quin., gr. xv, aromat. sul. acid, qs., spir. frumenti, ʒ ii. Sig. tea-spoonfull every four hours during the day. Morph. sulph., gr. ss., at 9 P. M. Beef-tea continued, and ulcer cauterized with solid nit. argenti., and afterwards dressed with lint, saturated with olium olivia. This treatment was kept up daily, steadily, until the 7th of July (omitting the cautery); my patient gradually emaciating and vital forces diminishing, and ulcer increasing in size. This morning (July 7th), pulse 115, tongue dry, brown and tremulous; emaciation great, urine scanty, countenance anxious and haggard. ℞, cautery nit. acid, followed with poultice of linseed, and internally, quinine and whisky freely, and farinaceous diet. Morphine continued at bedtime in ss. gr. doses. This treatment was continued until July 11th (again excepting the cautery). At this time the prescription was changed to ℞, ferri. et quin. citras, ℈ i, aqua pura, ʒ iii. Mice sig. teaspoonfull every four hours during

the day; at 9 P. M., morph. sulph., gr. ss., soda bi carb., gr. iv, camph., gr. ii. July 12th. Treatment continued. July 13th. Pulse 120 and feeble, prostration great; the slough had extended from the shoulder nearly to the elbow-joint, and nearly encircling the arm, completely dissecting off all the cellular tissue, exposing the deltoid and biceps flexor cubiti muscles; also portions of the triceps extensor cubiti, and exposing the brachial artery, and strangely enough, the phlegmon in the axilla had almost entirely healed. Prescription this morning (July 13), bromine wash, strength, officinal solution, gtts. xxx; aqua pura, Oi, applied morning and evening; milk punch ad libitum; anodyne at bedtime, pulv. Doveri, gr. x, camph. gr. ii. July 14. Appearance of sore better. Slough cleaning up, skin and tongue slightly moist; had a free discharge of urine; pulse 110 per minute. Prescription of yesterday continued. July 15. Sore clean, with healthy pus and granulations commenced, and convalescence fairly established. Treatment continued.

From this date to the 20th of the same month, no change of treatment was had, except the bromine was applied once a day. The granulating process progressed well, appetite and strength increased, all the secretions became normal, and I felt proud of the progress Little George (as we all called him) was making toward recovery. There was rejoicing through the entire ward; everybody was interested in him; the good women of the neighborhood brought him boquets and palatable delicacies. But on the morning of July 20th he was attacked with dysentery, which was at the time an epidemic in the hospital. In his prostrated condition, under this new malady, he rapidly sank, and in spite of my efforts, aided in counsel by Surgeon Bailey, who was then Surgeon in charge, he died on the evening of the 23d of July. No post-mortem was made, from the fact that, because of his great patience and gentleness, I had become much attached to him. I thought the scalpel would reveal nothing new in his case. In conclusion, I have only to add, that I believe the bromine arrested the progress of the sloughing process in the case of Private Noice, as it

has in all other gangrenous or syphilitic sloughs in which I have used it, and I am also fully persuaded that the antiseptic detergent and other medicinal properties of this drug, have not been overrated by its most enthusiastic friends and admirers.

I have the honor to be,

Very respectfully,

R. N. BARR,

Surg. Chg. Hospital.

American and Foreign Intelligence.

Lecture on Vaccination—Delivered at St. Mary's Hospital Medical School. By GRAILY HEWETT, M.D., Lecturer on Midwifery and Diseases of Women and Children.

GENTLEMEN: As one of the teachers on Midwifery and Diseases of Women and Children in this medical school, it devolves on me to impart to you some instruction on the subject of vaccination. The existing state of things is such that the responsibility of performing the operation of vaccination falls almost universally on obstetric practitioners; and for this reason it has been found convenient to arrange so that vaccination shall form a portion of the course of lectures on obstetrics and allied subjects.

Of four out of the principal discoveries for which humanity is deeply indebted to Medicine—the cure of intermittent fever by Peruvian bark, the invention of the forceps in midwifery practice, vaccination as a remedy for smallpox, and the use of anæsthetics—the discovery of vaccination stands pre-eminent. Regard the matter from whatever point you will, it cannot be denied that vaccination is a greater remedy, a larger saver of human life, and a therapeutical agent more potent, than any of which we are possessed. If other remedies have saved their thousands, vaccination has saved its tens of thousands.

The responsibility of, and the necessity for, placing before you an exact statement as to the nature and power of vaccination are thus equally great. The very circumstances that the remedy is so sure has operated injuriously as regards the extent to which it has been considered necessary to impart systematic instruction on vaccination at the medical schools throughout the country. While,

however, the power of vaccination to prevent smallpox is day by day more substantiated by facts, it is now beginning to be recognized that, in order that it may afford all the protection it is capable of affording, it is essential that great care be exercised in its performance. Hence, also, the necessity for a more systematic instruction of students in medicine in all that relates to vaccinnation has come to be admitted. It has been stated on very high authority that vaccination is better performed in most countries in Europe than in England. It is probable that in other civilized countries, simply owing to the greater care and attention there bestowed upon the operation, the immortal discovery of Jenner has more largely benefitted the community than in England, its birth-place.

I shall now proceed to lay before you the principal facts regarding vaccination, the mode of its performance, the best means of insuring success, the differences between good and bad vaccination; and lastly, I shall endeavor to point out why it is that vaccination has, particularly of late, appeared to be to a certain extent a failure, as a preventive of smallpox, in this country.

Vaccination is preventive of smallpox. In order that you may understand what smallpox was prior to the introduction of vaccination, thus enabling you to judge of the magnitude of the boon conferred on humanity by its discovery; in order, also, to assist you in removing the prejudices and practical obstructions likely to be met with in practice, it will be advisable to mention a few of the principal facts and statistics bearing on this interesting subject.*

The mortality from the smallpox was formerly something awful, something almost inconceivable. In Sweden, for instance, in the twenty eight years before the introduction of vaccination, the deaths from smallpox were 2,050 per annum for every million of the population. Contrast this with the history of smallpox in Sweden forty years after, when the deaths amounted to only 158 per annum for every million of the population. The benefit of vaccination is obvious from these figures. In Westphalia, between 1776 and 1780, the death-rate from small-pox was 2,643 for every million inhabitants; but between 1816 and 1850, during which vaccination was established, it was only 114. In Copenhagen, in the last fifty years of the last century, the deaths were 3,128 per annum for every million inhabitants; but in the next fifty years (from 1800 to 1850) the number was 286. Take, again, the experience of the Royal Military Asylum. Out of 5,744 boys who have passed through this institution during forty-eight years, only four deaths have taken place from the smallpox, and those were unvaccinated cases.

The natural history of smallpox, in undisturbed and in unprotected communities, may be summed up in a very few words. Of

* See the Blue-book on Vaccination, published in 1857, and which contains an elaborate, eloquent, and almost exhaustive account of vaccination from the pen of Mr. Simon.

every 100 persons attacked about 35 die. But the mortality is much greater in the case of young children than in the case of old persons. In the case of children under five years of age, out of every 100 attacked 50 will die. From the age of five to ten, out of every 100 attacked 27 will die; from ten to fifteen, 23 will die; from fifteen to twenty, 26 will die; from twenty to twenty-five, 40 will die. And after this period the percentage greatly increases; so that from twenty-five to thirty, 45 per cent. will die; from thirty to thirty-five, 57 per cent.; from forty to sixty, 69 per cent.; and between sixty and ninety the mortality is 75 per cent. So that in the cases of very young and very old persons smallpox is peculiarly fatal. Of 2,654 patients admitted during sixteen years into the Smallpox Hospital, affected with smallpox and unvaccinated, 996 died—*i. e.*, 37 per cent.

But it is not simply that smallpox kills—this is not the extent of the evil. Among those whom it permits to recover, the conditions left are in many cases distressing in the extreme. Blindness is very frequently the result of smallpox. Then there is the disfigurement by scars—the destruction, the total destruction in many cases, of the good looks of the patient; and lastly, the general health is frequently profoundly shattered by a bad attack of smallpox. So that not only does smallpox kill thirty-five per cent. of those whom it attacks, but it frequently produces effects in those who recover from which every one would be desirous of escaping.

How far does vaccination prevent this evil, and in what degree? Dr. Woodville's evidence, given before a commission appointed by Parliament to inquire into the subject in 1802, was as follows: "Within the two years, 1799 to 1801, 7,500 persons were vaccinated at the Smallpox Hospital, of whom about one-half were subsequently inoculated with smallpox matter, and in none of them did smallpox produce any effect." This is a remarkable, and in the history of vaccination, an old fact. But there is another more recent and still more remarkable which I have to bring before you.* In the public institutions of this metropolis there are vaccinated annually about 20,000 individuals, and it is natural to suppose that a very large majority of smallpox patients belonging to this class of the community would be admitted into the Smallpox Hospital. But it has been found that there have been admitted into this hospital only about nine individuals per annum of those who have been vaccinated at the public institutions of the metropolis, and consequently, only one individual in 2,108 thus vaccinated has become a patient of the Smallpox Hospital. Of those who have been so vaccinated, what is the number of deaths that have taken place in the Smallpox Hospital? There has been only one death in 36,000. It is reasonable, therefore, to infer that in this metrop-

* This fact was stated by my friend, Mr. Marson, in his most valuable paper, "An Analytical Examination of all the Cases admitted during Sixteen Years at the Smallpox and Vaccination Hospital, London," vol. xxxvi. of the Med.-Chir. Transactions.

olis in the case of properly vaccinated persons the chances are nearly 30,000 to 1 that they will not die of smallpox, and that the chances are not far short of 2,000 to 1 that they will not take smallpox at all. The metropolis has been badly protected, many of the inhabitants never having been vaccinated at all, and there is thus always a soil adapted for the growth of the disease. In districts where vaccination has been universally practiced, smallpox is unknown, except in the case of individuals bringing the disease with them from other places into the locality. Facts in abundance are available in support of this statement.

We have next to inquire—*Is vaccination, well or indifferently performed, and of various degrees of intensity, equally protective against small pox, or against death from small-pox?* This is a most important question, and one which the facts that have only of late years come to light, render peculiarly interesting. The following very remarkable facts observed by Mr. Marson* bear directly upon it: During the sixteen years ending 1851, there were admitted into the Small-pox Hospital 3094 individuals protected by vaccination. There were 1357 persons with one cicatrix; 888 with two cicatrices; 274 were admitted with three cicatrices, and 268 were admitted with four cicatrices. The mortality in these different cases was as shown by the following figures:

			Mortality per cent.
With 1 cicatrix, 1357 cases	Good	768	4.23
	Indifferent	589	11.95
" 2 cicatrices, 888 "	Good	608	2.68
	Indifferent	280	7.29
" 3 cicatrices, 274 "	Good	187	1.63
	Indifferent	87	2.32
" 4 cicatrices, 268 "	Good	202	0.99
	Indifferent	66	0.00

It requires but a very slight inspection of these figures to see the relation which subsists between the goodness and intensity of vaccination and protection from death from small-pox. In the 768 individuals who had only one good cicatrix, the deaths were four out of every hundred; and of those who had an indifferent cicatrix, the mortality was eleven per cent. When two cicatrices were present, the mortality came down very much—from four to two, but still it was higher in those who had indifferent cicatrices than in those that have good ones, in the proportion of 2.68 to 7.29. With three cicatrices the mortality is still reduced, being 1.63 with good, and 2.32 with bad cicatrices. With regard to those admitted with four cicatrices, the number of deaths was excessively small, not one in a hundred. There were some individuals who were worse off even than those with one cicatrix—viz., those who had been vaccinated, but who had no cicatrix at all. Of these there were 290, and the mortality amongst them was 21.73 per cent. Mr. Marson finally states in reference to the statistics—"Test the

* Med.-Chir. Transactions, vol. xxxvi.

question in which way soever you will, the result is in favor of producing four vesicles at least at vaccination." The confluent form of small-pox appears to affect most those with few cicatrices.

The power of vaccination to prevent those attacked with small-pox from dying of the disease, is thus in direct ratio to the goodness and efficiency of the vaccination; for it results from Mr. Marson's very valuable observations, that of the whole number of individuals attacked with small-pox and previously vaccinated, seven per cent. die; of the badly vaccinated, fifteen per cent. die; but in well vaccinated persons—understanding by the term "well vaccinated," those having four or more cicatrices, the mortality is less than one per cent.

Recently the results of some very important inquiries as to the method in which vaccination is practised in different parts of England have been published.* The reports of these inquiries, made respectively by Drs. Seaton, Stevens, Sanderson, and Buchanan, furnish information particularly interesting at the present moment; and in relation to the question as to the protective power of good and bad vaccination, my friend, Dr. Buchanan, in the course of the last year, examined, under the direction of the Board of Health, a number of children. Some of the results obtained I will now mention. Dr. Buchanan, for instance, examined in the schools of certain unions in the country, 15,041 children indiscriminately: 185 of these bore the scars of small-pox—1 in every 81; 12,860 out of the 15,000 had been vaccinated, and only 12 of these, or 1 in 1000 had the scars of small-pox, being only 0.10 per cent. of the whole number. Taking the 2804 children who were unvaccinated, 171 were scarred, or upwards of six per cent. With reference to the 12 individuals who had been vaccinated, and were found scarred, the vaccination having failed to a certain extent, there was only 1 who had three good cicatrices; 3 had each three very bad cicatrices; 1 had two passable cicatrices; 1 two bad ones; and 6 children had only one cicatrix, in which the quality was bad. Thus 11 out of the 12 children who had been vaccinated and took the small-pox, had been inefficiently vaccinated. These facts are in remarkable agreement with the results of Mr. Marson's observations as to the history of small-pox occurring after vaccination, and they prove incontestably the great protective superiority of good over bad vaccination.

Is the protective power of vaccination affected by lapse of time.—This is a most interesting question, involving as it does the decision as to the necessity or otherwise of *revaccination*. It would appear that after the lapse of a certain number of years the protective power of vaccination has a tendency, more marked in some individuals than others, to wear out, and a resusceptibility to small-pox arises. The history of revaccination lends support to

* Fourth Report of the Medical Officer of the Privy Council. Ordered by the House of Commons to be printed April 11, 1862.

this view, which is, as Dr. Budd has recently very justly observed, supported by what physiology teaches in reference to the change and renovation of the body, it being the fact that about every seven years the body is physically completely changed and renewed.

Some statistics as to the history of revaccination in the Prussian Army (from Mr. Simon's work,) must be mentioned in connection with this subject. For many years past it has been the custom to revaccinate every soldier admitted into the Prussian Army. In 1833, the system of revaccination in the army was begun; and in that year the percentage of cases in which the vaccination took effect was 33. The percentage of revaccination success has progressively increased since that time, the percentages each year being represented by the following figures: 33, 39, 42, 46, 49, 50, 52, 54, 57, 58, 57, 58, 60, 64, 64, 64, 61, 64, 69, 69, 69, 70; so that the percentage has increased from 33 to 70 per cent.

These figures prove that in Prussia—a country in which, so far as is known, vaccination is well attended to—the first vaccination has been followed by a resusceptibility to the vaccine disease, which is not represented constantly by the same figure. These statistics lead probably to the view that the efficacy of the vaccine lymph used throughout Prussia has deteriorated in the process of time. The latter is a point which will be specially referred to in the next lecture. But we are now concerned with another question: the possible wearing out of the protective power of vaccination against smallpox by lapse of time. It is reasonable to infer that if a resusceptibility to the vaccine disease be shown to arise in the individual, a like resusceptibility to smallpox will concurrently arise in that particular case; and the impression has been for several years past here gaining ground that revaccination is proper, and even necessary, once or more in the life of the individual. Mr. Marson states that during seventeen years not a single servant or nurse belonging to the Smallpox Hospital has taken smallpox, and the universal custom has been to revaccinate the servants, nurses, and attendants in or about the hospital on entering on their employment at this institution. It does not appear that the goodness of the first vaccination necessarily extends the limit which time usually places on the vaccination as protective from susceptibility to the vaccine disease; in other words, an individual well vaccinated at first may be found as liable to take the vaccine disease after the lapse of twenty years as one imperfectly or badly vaccinated. *For the time*, and probably in by far the majority of individuals, good vaccination is almost absolutely protective; but after the expiration of a time, which appears to vary in different individuals, which is influenced by idiosyncrasy or some unknown cause, a resusceptibility to the vaccine disease—and probably also consequently to the smallpox—arises, whether the primary vaccination have been good or bad. If the effect of good primary vaccination wear out in course of time, *à fortiori* must the effects of bad vaccination wear out pro-

portionately sooner. The conclusion to be drawn as to revaccination is, that revaccination should be performed at the age of puberty, and perhaps again at the age of twenty-five or thirty. and that it is desirable also to revaccinate at other ages than these during epidemics of smallpox, and especially in the case of individuals likely to come into contact with smallpox patients.

History and nature of vaccination.—For a full account of the early history of vaccination, and of the manner of which, step by step, our countryman Jenner arrived at a discovery which is emphatically *the* discovery of modern times, I must refer you to the numerous works on the subject, and especially to the Report on Vaccination, by Mr. Simon before alluded to. Time will only allow me to remind you of the chief facts. Jenner performed his first vaccination in 1796, the subject of the operation being a boy aged eight. This child was afterwards innoculated with smallpox without effect. In 1798 Jenner published his essay on the sul ject. In 1801 six thousand individuals had been vaccinated; and Parliament voted Jenner the sum of £30,000 in recognition of the importance of his discovery.

The disease known as the vaccine disease, and which is witnessed on the udder of the cow, is in reality the smallpox affecting the animal. In this country, Mr. Ceely. of Aylesbury, and Mr. Bradcock, of Brighton, have proved that this is the case by inoculating cows with smallpox; and well-marked vaccinia has thus been produced. From cows so inoculated individuals have been vaccinated, the results being identical with those of vaccination with matter as ordinarily obtained from the cow. It is probable that if these facts had been known at the time Jenner made his discovery, much of the prejudice which he had to encounter would have been removed. Individuals had an objection to taking the disease of an animal, but there would naturally be less objection to taking a disease the identity of which with smallpox had been proved. Jenner surmised that it was so, as is evident from the name which he gave to the disease—"variolæ vaccinæ." The vaccine disease, then, is the smallpox which has passed through the cow, and which has, in so passing through the cow, become so modified that, when reconveyed to the human subject, it gives rise to a disease of exceedingly slight intensity, but which nevertheless is still the smallpox. For a full account of the vaccine disease I must refer you to the ever-to-be quoted paper in the "Transactions of the Provincial Medical and Surgical Association," vol. viii., by Mr. Ceely, of Aylesbury.

In the next place, we must consider *the phenomena produced by vaccination in the human subject.* The necessary outline of the subject now to be given must be completed by actual inspection and comparison of vaccinated cases, opportunity for which is afforded you at an adjacent public vaccination station. This practical study of the subject is absolutely essential.

Vaccination for the first time.—After the arm has been punc-

tured, and the vaccine lymph introduced, the first effect is identical with that which would be observed if the lancet had been uncharged with lymph; it so remains during the next two days; and it is only on the third day, or towards the end of the third day, that appearances are observed about the wound of an unusual character. It then becomes red and slightly elevated. On the fifth day the cuticle covering this little red spot is elevated into a small pearl-colored vesicle: and this vesicle evidently contains a fluid. The vesicle varies in shape according to the shape of the incision made—it is round if a simple puncture be made; it is oval if there has been a small incision in the skin. On the eighth day—that is to say, at the close of the seventh day—the vesicle has become much larger; and it is then in perfection, as it is termed. The margin of the vesicle is turgid and elevated; the color is now somewhat yellow, not quite so transparent as it was, and on close inspection, it is evident that the vesicle is cellular, and divided by septa, there being from ten to fourteen cells in each vesicle. Moreover, the vesicle is what is termed umbilicated, having a depression in the centre, over which part there is no elevation of the cuticle into bladders. After the eighth day there is formed what is termed the areola, the skin around the vesicle becoming red, sometimes of a deep red tinge; the surface of this areola becomes tense, hot, and at the same time painful; the areola is usually circular. If the points of vaccination be close to each other, there will be a large red spot surrounding the whole, extending sometimes a considerable distance up and down the arm. An occasional but very rare result, and one which appears to be connected with the use of bad lymph, is inflammation of the cellular tissue of the arm. The glands of the neck and armpit are usually slightly swollen. During the eighth and ninth, or even tenth day, the increase in the size of the vesicle goes on. It is extremely important that the two things—the *perfection* of the vesicle and its *greatest size*—should not be confounded. The vesicle is in perfection on the eighth day; but it is at its largest size on the ninth or tenth day. On the eleventh day the vesicle begins to fade, the lymph within becomes absorbed or the vesicle breaks and it is discharged, and a scab forms, which becomes hard, dense, firm, and black, and finally falls off at a time which varies from the eighteenth to the twenty-first day after the performance of vaccination. There is left behind it a cicatrix, which is quite indelible if the vaccination be efficient. Such is the course of the disease normally.

Occasionally there is observed what is termed "retardation" of the disease, and this may take place up to sixteen days, possibly even later. The arm does not "take" so early as it should do, although the disease, after it has begun to take, may go through the same course as that ordinarily observed. On the other hand, a too early taking of the vaccination indicates irregularity, and is usually due to some defective character of the lymph used.

Secondary vaccination.—As a rule, when vaccination has once been performed, the individual is no longer susceptible to the *regular* vaccinia. The effect of the vaccination is, under these circumstances, that irritation is set up analogous in *kind* to that observed in primary vaccination, but the disease sets in quickly, the redness often beginning immediately after the operation; the vesicles are imperfect; there is litte evidence of presence of fluid; the duration of the effect is only five or six days (although variations in this respect may be noted), and the scar left behind is correspondingly small, and wanting in the typical characters. In quite exceptional cases the secondary vaccination takes perfectly, and the course of the second vaccination is more nearly identical with that of the first. These cases, in reality, resemble those in which has been observed the occurrence of small-pox after good vaccination.

Characters of the cicatrix following good vaccination.—It is important that you should be aware of the characters of a perfect scar, and note them accurately. The scar resulting from good vaccination is usually circular; it is radiated, indented, and foveated, having a number of little pits upon its surface; and it has a well defined edge. Good cicatrices are generally of a considerable size. The size of a typical scar, such as would be observed after vaccination by the puncture of a lancet, which is the ordinary method, is that of a three-penny piece—just five-eights of an inch in diameter.

Now what are the characters of a defective scar? A defective scar is more or less wanting in all the characters mentioned. It is comparatively smooth; without indentation; without the little pittings; the edges are irregular and ill defined, and it is often very small.

Lastly, with reference to the phenomena of vaccination as ordinarily observed. Up to the seventh or eighth day the child is perfectly well, but there generally set in at this time some constitutional disturbance and signs of irritative fever. This varies in degree in different cases; it is sometimes considerable.

It need hardly be observed that the wound inflicted by the vaccination is, like other wounds, liable to be affected by injurious conditions of the surrounding atmosphere. Pyæmia may follow the use of bad lymph; erysipelas has in rare instances been observed. Ordinary care is sufficient to prevent such evils.—*Lancet*, June 13, 1863.

Disease apparently congenital.—1. *Ordinary asthma. Exciting cause. Symptoms. Remedies.*—2. *Hay-asthma. History of the case. Description of a paroxysm.*—3. *Cat-asthma. Asthmatic symptoms. General and local symptoms. Nature of the affection.*

I have every reason to believe that I have been subject to an asthmatic affection from the time of my birth, and that my asthma

is constitutional or congenital; the recollection of my earliest years is associated with much suffering from it. As well as my memory serves me, at the youngest period of life it was at the worst, and has gradually diminished up to the present time. In childhood I do not know that I was ever entirely free from it, that is to say, I could never take a deep breath without a wheezing sound, but now, except when suffering from attacks, I am free from the least trace of it; notwithstanding it was then, as it is now, almost entirely under the influence of exciting causes.

Exciting causes.—These are numerous, dissimilar, and some subtle and unaccountable; they are chiefly these: Cold, change of air, a recumbent posture, laughing, coughing, sneezing, bodily exercise, hay-fever, and, what is decidedly remarkable, the proximity of a common domestic cat. Several of these causes are secondary to others, and cannot be easily distinguished; for instance, I do not know that a recumbent posture would, or moderate exercise would ever produce a paroxysm without a present tendency from the effect of cold, an unfavorable air, etc. The two last in the above catalogue of causes I shall consider separately—hay-fever and the cat-asthma; the first of these is entitled to this distinction because it is invariably accompanied by other symptoms, asthma being only one among many peculiarities equally conspicuous; and the last on account of its singularity.

I shall now describe my common asthma, that is, my asthma exclusive of that produced by hay-fever, or the proximity of a cat.

I was an exceedingly delicate child—pale, thin, weak, sickly-looking, and cadaverous. Besides asthma, a foe ever present or near, I was subject to sore throat, bronchitis, swollen glands in the neck, enlarged tonsils, Eustachian tube deafness, headaches, and habitual wakefulness at night, a variable appetite, and an inability to stoop my head low, from a feeling of sickness which it invariably produced; I was debarred from the natural and healthful sports of childhood, for I could neither run nor laugh heartily without danger of a suffocating paroxysm of temporary asthma. At the age of twelve or thereabouts, I went to reside at a school at Salisbury, where the inland air, and probably the regular mode of living, produced a total disappearance of all these symptoms of delicate health, and I became stout and strong, and my appearance remarkably healthy and robust. During this time I do not remember to have had one paroxysm of asthma, or that my sleep was at any time disturbed by it, nor on my return home for the vacations, on finally leaving school do I remember any recurrence of it. But two or three years after I had left Salisbury, my general health still remaining excellent, I remember I was perpetually distressed and burdened with *tightness of breathing* (to use an expression that seems to imply the sensation), to a degree and with a frequency sufficient to destroy my comfort. Thus, in my early life, my health was bad and my asthma severe; at Salisbury my health was excellent and my asthma was gone; subsequently, my health

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remaining good, my asthma returned. So stands the case as bearing upon the question whether a good or bad state of general health has an influence on the asthmatic tendency, and the inference to be drawn from the facts, considering the possible influence of other exciting causes, is involved in much uncertainty.

In my case the most prominent and frequent of all the exciting causes is, what is commonly called *taking cold*, and this acts either directly, when the asthma becomes the immediate consequence, or remotely through the intervention of inflammation or congestion of the lungs, when the asthma comes on later. As it regards the first, if I walk in the garden when the air is damp and chilly, in ten minutes my breathing becomes sensibly affected. At night, if my dress is not securely closed in front, or the bed-clothes well adjusted about my neck and shoulders, a certain degree of asthma presently ensues. It has sometimes happened that I have fallen asleep without having made these necessary arrangements, and the consequence has been, that I have awoke with a fit of suffocation, which, after the removal of the cause, has subsided in the ordinary way. The asthma consequent on cold on the chest (bronchitis) is of a most painful and distressing kind; unlike that produced by cold directly, it often lasts for days. In my childhood I suffered grievously from it; I can remember, when I was very little, spending hours at a time on a footstool, with my head on a chair, as the best means of obtaining rest, together with ability to breathe. But it has frequently happened, at all events of late years, that I have had very severe colds, attended with soreness of chest and expectoration, without any concurrent asthma.

Another of the primary causes of asthma with me is change of air. That this produces my asthma I know from the fact that attacks have often occurred for the first few days or weeks after arriving at a place where, during a former residence—and, subsequently, when the effect of the change had passed off—I was as free from all trace of the complaint as I have ever been.

The remaining exciting causes—a recumbent posture, laughing, coughing, sneezing, bodily exercise—I call secondary causes, as I cannot be sure I have ever suffered from any one of them without being at the time in a condition of tendency to asthma from some primary cause. So great is the influence of laughing to induce asthma that I have always been obliged, especially in childhood, to avoid it as much as possible on account of its distressing consequences. Coughing, though a symptom of the complaint, is also a source of aggravation, and, when there is no appearance of asthma, is sufficient to call it into existence. A violent fit of sneezing in the summer will produce asthma, otherwise not. I have always suffered from the effects of bodily exercise, especially in childhood; but even at my present age I cannot run a considerable distance, or jump a child, or skip with a skipping-rope, without the occurrence of some asthma.

Symptoms.—Not the least interesting part of this subject is the

form of my asthma—its conditions and symptoms—which I shall endeavor to describe. The difficulty of breathing that characterizes it may exist either as a paroxysm of suffocation or a continuous feeling of tightness and impediment: this last may continue for days or weeks, with some variation in degree, and prevails during damp seasons, and the influence of hay-fever. The paroxysm is attended with a wheezing sound, more or less audible, but this only occurs when the paroxysm is about to diminish; at the commencement and throughout the worst there is no sound which can be perceptible to any one but myself, as on listening, I can only hear a faint long sigh, such as I should imagine would be produced by blowing through a sieve. At this time the visible signs are, a distressed expression of face, open mouth, elevated shoulders, and somewhat of heaving or gasping—all these in proportion to the degree of spasm. Presently a change ensues, the wheezing sound commences, the attack then becomes more distressing to observers, but less so to the patient. Apparently a looseness of the mucus follows the commencement of sound, which mucus continues to present itself at the top of the trachea, and to be disposed of in the ordinary way, even after the sound which gradually becomes fainter, has ceased altogether. The lungs then resume their former normal condition; but an occasional deposit of mucus, and a necessity of clearing the throat, will occur at intervals for some time after, but not long, if the spasm is produced by some sudden and violent exciting cause, and does not indicate an asthmatic condition. The *continuous* form of asthma which I have noticed is but a mild and continuous phase of the other, but is always indicative of a liability to spasm from any secondary cause. It is unattended with sound, except on making a deep expiration, which, if performed, is immediately followed by a cough, or inclination to cough; but during the whole of the period the mucus continues to be abundant, impeding the voice, and requiring to be perpetually removed. This deposition of mucus is one of the most characteristic features of the complaint. I believe no asthma, however slight, exists without this concomitant (of course I am understood, here and throughout, to be recording only my own experience), for which reason I am always careful to avoid laughing before singing; for though the asthma thereby produced may not be perceptible, the subsequent impediment by the production of mucus indicates some previous asthmatic affection.

There are two peculiarities to which I have not yet referred—the asthmatic headache, and an itching sensation about the chin, the middle part of the chest, and at the back between the shoulders. This headache is never present except in a violent paroxysm, with which it subsides, commencing after the difficulty of breathing has existed for some little time. Such headaches do not accompany all violent paroxysms of asthma, but are of rare occurrence; still they are so peculiar and characteristic as to be entitled to rank among the symptoms of asthma. They are unlike any other headaches,

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unaccompanied by nausea, and consist of an acute pain over the brows and in the front part of the head, and a feeling of fulness; they are greatly aggravated by coughing, during which the pain becomes intense. The other peculiarity is as characteristic, but more remarkable; this belongs chiefly to the asthmatic paroxysms, but to which, unlike the headache, it is not entirely confined. I refer to the itching sensation about the chin, the middle part of the chest, and at the back between the shoulders. This itching does not resemble ordinary itching, being of a peculiar irritating character; when very bad it might almost be called *stinging*, and it is impossible to allay it by rubbing or scratching, or to determine the exact part which itches. If the chest be rubbed all over, the itching seems to fly to the back about the region of the backbone between the shoulders, or to the chin; the same occurs with the chin and the back; whenever an attempt is made to remove the itching by rubbing or scratching, if it moves at all, it appears in one or other of the three localities mentioned, and so till the end of the spasm, or till that symptom subsides. The most ordinary is the itching on the chin, and though so little benefit is derived from it, it is impossible to avoid scratching; the nails go up instinctively, and persevere in a vain application of the usual means of alleviation. I shall have occasion to refer to this symptom in reference to the hay-fever and cat-asthma.

Remedies.—Of remedies I have not much to say, as I have seldom used any; to speak paradoxically, the best remedies are the avoiding the causes. As taking cold is so frequent a cause of asthma, I have found it of the greatest importance that that should be prevented, and when a cold is the occasion of asthma, the obvious means of alleviation are those which tend to cure the cold. It is essential to me to keep the feet dry, and it is of great advantage to keep the extremities warm, especially during the presence of asthma. As a recumbent position is not the most convenient for breathing, besides being sometimes a direct cause for asthma, I sit upright during the paroxysm, or, in case of fatigue, lean forward, resting my head on a table, or on something placed upon it of a convenient height. I have never been obliged to have recourse to emetics for asthma: I have taken antimony with very great advantage as regards the difficulty of breathing. As well as I can remember, all the symptoms of asthma disappeared, but the effect of the medicine was so distressing and so depressing that the remedy was never repeated. I tried smoking tobacco for some little time, and discarded it for the same reason; the alleviation that it afforded was only in proportion to a sensation of faintness and nausea, and a horrible feeling; consequently, smoking was speedily abandoned as a source of comfort. If I had persevered till habit had overcome the painful effects of the poison, I believe smoking the tobacco would have had no effect at all, and would have ceased to be a remedy. I have occasionally had recourse to mild doses of ipecacuanha, and have found it a most comfortable and useful medicine.

There is an instinct in suffering which suggests the immediate requirements of the sufferer, and the natural means of palliation. For instance, in asthma, the next desire after a favorable position of the body is fresh air, cool air, and plenty of it. Frequently when I have been walking in the country, and have been conscious of the presence of some asthma (perhaps principally during the past season), and have been visiting some of the cottagers in their warm close rooms, I have been obliged to escape, from a feeling of actual suffocation, to the open air. For the same reason we see asthmatics with their mouths open, with the aspect of fish ejected from their natural element.

I have now described my case as respects the common asthma, including exciting causes, symptoms, and remedies. It only remains to relate the peculiarities of my asthma as it presents itself during hay-fever, and in consequence of the proximity of a cat; which two subjects, for the sake of convenience, I shall detail separately, and as distinct from the common asthma, though in reality it is but one asthma, and every attack, from whatever cause, and with whatever accompaniments, is consequent on an asthmatic constitution.

HAY-ASTHMA.

My hay-asthma differs from the common asthma only in its origin and its accompaniments; it is necessary, therefore, I should describe the malady as a whole, detailing all the symptoms and peculiarities of what is commonly called hay-fever.

It seems resonable to suppose that I must have been liable to hay-fever, at the ordinary season, during the whole course of my life, but till within the last few years I was never aware of its presence, or of the existence of such a malady. From the frequency of my asthma, and common colds in early life, it is probable that a recurrence of asthma at a particular season, and the other symptoms of hay-fever were overlooked, and that when I became less generally subject to asthma, the tendency to hay-fever remaining, that complaint more distinctly declared itself; or it may be that of late years I have become constitutionally liable to hay-fever—either more susceptible of the influence, whatever it may be, or have acquired a constitution capable of evolving the symptoms.

The period of the commencement of the hay-fever, and the length of its continuance are very variable, being never exactly the same two years following; for one or two seasons, not long since, it did not make its appearance at all, or was so slight as to be scarcely perceptible. Speaking generally, I begin to perceive it about the middle of May, and it ceases about the middle of July; but I have observed that this depends somewhat upon the forwardness of the season, and the progress of vegetation.

That which distinguishes my case (as I suppose) from the ordinary cases of hay-fever, is that the asthma is the most conspicuous

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feature. During the period of hay-fever there is always a liability to spasm from an exposure to the influence, or there may be, for a part or the whole of the period, a slight but continuous asthma, and a liability to paroxysms from any secondary cause. I have suffered most from paroxysms while taking country walks, walking through grass meadows, and especially in one particular garden surrounded by fields. The prevalence of the influence in this locality is very remarkable, as there is nothing peculiar in the neighboring soil or its products. I know one other locality where the influence is still more excessive; here there is abundance of flowering grass and rushes, the region is flat, the soil marshy, and in the neighborhood there is a great variety of indigeneous vegetation. If the influence arises from the grass, it is not necessary it should be cut and dried, that is to say, the proximity of *hay* is not essential.

The paroxysm generally commences with sneezing, which continues as long as the operation of the influence which produces the spasm. The sneezing appears to be the most readily produced of any of the symptoms, and results directly from the influence; it is of a peculiarly irritating character, and greatly aggravates the asthma; it is followed and accompanied by a stinging, itching feeling in the nose, an irritability all over the skin of the face, a watery condition of the eyes, and consequently of the nose. I have frequently returned from a walk with my handkerchief as if it had been dipped in clear water; the eyes become injected, the *carunculæ lachrymales* more or less swollen, and the face wears somewhat the same appearance as during a severe cold. When the paroxysm has continued for about an hour there ensues a feeling of disarrangement about the upper part of the throat and palate and back of the nose, as though the whole of that region were mashed up together, so to speak, and had become swollen and undefined. This condition is frequently accompanied by an itching sensation in the Eustachian tubes, which induces a desire to move the back of the tongue, or to thrust the fingers into the ears, so as to allay the itching, but as the part affected cannot be reached, the itching can scarcely ever be alleviated. If this condition of the throat and palate continue for some time, perhaps about an hour, there ensues a feeling of soreness in the throat and chest, as in the case of a common cold. There is, during the whole of this period, a feeling of general irritability; on such occasions the tickling of a hair, the blowing of the wind, any inconvenience or disarrangement of dress, the hitching of brambles, all interference, weight, or incumbrance, become quite intolerable. But the most conspicuous symptom is the asthma, which must always continue longer than the sneezing, since sneezing on such occasions always produces it, and when it has reached the worst it takes some time to subside. The asthma during these paroxysms is violent, with a feeling of tightness and suffocation; it is accompanied with a wheezing sound, and is followed by much mucus.

These paroxysms of hay-asthma always exhibit the peculiar phenomenon of the itching of the chin; this itching, unlike the other symptoms of the hay-fever, is attendant only on the asthma, and belongs exclusively to it.* After all the symptoms have mostly subsided, which, if the paroxysm occur in the evening, seldom happens entirely before sleep, the throat remains sore, at least in appearance, being red and vascular; the edge of the palate is very red; and the parts contiguous somewhat swollen and undefined, and there is considerable mucuous exudation. Always after these attacks, there remains for some little time a liability to asthma from every slight cause, and an inclination to the short asthmatic cough. The asthma may recur on lying down in bed and disturb the early sleep, but this with me is not of common occurrence. During a good night's rest all is set to rights, and every symptom disappears, except those appearances which, were I not aware of the circumstances, would lead me to suppose I was recovering from one of those severe but short colds to which I am subject in the summer time;—the face is somewhat pale, the eyes stiff and injected, with considerable enlargement of the *caruncul*æ, which are somewhat encumbered with that kind of inspissated mucus which nurses call "sleeping dust." The throat is sore, and there is a degree of stiffness and swelling about the palate and tonsils, and the lymphatic glands beneath the jaw frequently appear swollen and distinct, and feel about the size of acorns. If the paroxism on the previous evening has been long and severe, there is a feeling of languor and debility, but this and all other indications disappear as the day advances.

I have had attacks of the hay-fever more frequently in the evening than at any other part of the day,† but I believe that this results solely from the circumstances that evening is the time for walking in the summer.

The remedies for these paroxysms which I have tried, if remedies they may be called, are very simple. The best treatment is to use the means which inclination dictates, and then to wait with patience till the symptoms subside. If an attack occurred in the evening, having provided myself with a perfectly dry handkerchief, and being comfortably and warmly dressed, I should sit quite still, half-reclining in a chair, in a room with the doors and windows closed, and so remain in stillness and rest, avoiding, if possible, coughing and scratching the chin, till I felt able to attend

*This differs from the experience of a lady, an acquaintance of mine, who is a victim of hay-fever, and who, although her hay-fever symptoms are quite free from any admixture of asthma, suffers grievously from this itching of the chin and between the shoulders, so that, to use her own expressions, "she could tear the inside of her chin out."

†This is not always the case with hay-fever; the morning is often the worst time. In the case of the lady referred to in the previous note, an attack invariably comes on from five to seven A. M. The source of these early attacks appears to be the first bright light of the summer sun.

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to some quiet employment, and then wait for sleep to complete the cure. If the attack occurred in daytime, I should in addition be careful to exclude light and noise. Light is particularly disagreeable and hurtful during attacks, but apart from this it is always comfortable on such occasions to shut the eyes.

This includes all I have to say respecting acute hay-asthma. The other phase of hay-fever is that slight continuous asthma which prevails frequently during the first half of summer, together with a frequent itching of the chin. This chin-itching is so conspicuous a feature in hay-asthma, that it may be considered a characteristic symptom, although it is by no means confined to that form of asthma which is produced by hay effluvium.

CAT-ASTHMA.

This singular phenomenon is, I imagine, almost peculiar to myself: I never heard of a similar instance, except in the case of one individual, a near relative of mine, who is subject to the same affection, only in a less degree. The cause of this asthma is the proximity of a common domestic cat; the symptoms are very similar to those of hay-fever, and, as in the case of hay-fever, are occasioned by some sudden influence inappreciable by the senses. I cannot recollect at what time I first became subject to the cat-asthma, but I believe the liability has existed from the earliest period of life. I believe some asthma would present itself if I were sitting by the fire and the cat sleeping on the hearth-rug; but the effect is much greater when the cat is at the distance of one or two feet, or still closer; it is still further increased by the raising of the fur and moving and rubbing about, as is the habits of cats when they are pleased, also by stroking their fur; but most of all when they are in the lap just under the face. The influence seems to be stronger in kittens from two months old and upwards than in full-grown cats. Having been almost always accustomed to cats, I have had abundant opportunity of testing the peculiarities of this singular phenomenon.

With respect to the symptoms, I have only to say they closely resemble those of hay-fever, with only such difference as might be expected from the near proximity of the cause, from its defined and local nature, and also for the facility for its entire and immediate removal. The paroxysm is consequently generally more violent than that of hay-fever, and the symptoms are not allowed to go through their regular course. The asthmatic spasm is immediate and violent, accompanied with sneezing and a burning and watery condition of the eyes and nose, and excessive itching of the chin, which may also extend to the chest and between the shoulders; the eyes are injected, and instinctively avoid the light, and the caruncles are more or less enlarged. I believe if the cause were suffered to continue, all or most of the other symptoms of hay-fever would ensue, only with a more excessive and conspicuous asthma. After the removal of the cause, the symptoms I

have described begin immediately to subside, and if the paroxysm is not very severe, the cure is effected in five or ten minutes, leaving, as in all other cases of asthmatic spasm, a tendency to mucus at the top of the windpipe, which being repeatedly removed in the ordinary way, the last symptom disappears, and the lungs and throat resume their normal condition.

This includes all I have to say respecting the cat-asthma; but I shall here notice the evidence of the more general influence of cats on my system—of the existence of what I am disposed to call cat-poison. I mention this partly because of its singularity, and partly because the symptoms arising from this general influence are often co-existent with those of cat-asthma, and are only occasioned by a different application of the same cause as produces, by its application to the respiratory surface, the asthmatic spasm.

The symptoms of this poisoning are consequent on touch or puncture. The eyes, lips, and cheeks are susceptible of the effect of touch, but a puncture of the claw affects equally any part of the surface of the body. The eyes are more readily affected than the lips, and the lips than the cheeks. I have often known the eyes and the lips most painfully affected by being touched by the fingers after handling a cat. That such a result may be produced by such a means proves very strikingly the power and subtlety of the influence. The eyes would at all times be affected by this means, but I do not think the lips would, unless there were some little crack or flaw in the skin, from cold or any other cause. The effect on the eye of rubbing it just after touching a cat is to produce a hot, stinging irritation of it, a profuse flow of tears and injection of the whole eye, a tender, painful swelling of the *caruncul*æ (the sensation is that of painfulness and itching combined), and intolerance of light. If one eye only is touched the other merely exhibits the ordinary effect of sympathy. The result on the lips is an enlargement of the whole lip, and sometimes a sort of lump or protuberance at the part principally affected, together with a feeling of heat and irritation. The cheek is not influenced by this secondary touch, but is affected by the slightest touch of the fur of the animal. If the cat rubs against the face the cheek immediately becomes hot, a little swollen, and of a suffused red; sometimes there appears a defined little protuberance, a something like nettle rash, which I imagine is produced by the puncture of a hair.

The wound from a claw, whatever be its form, is always surrounded by a white, hard elevation or wheal, very much resembling the appearance consequent on the sting of the nettle. The pain, which is very much greater than attends ordinary scratches, is accompanied by a feeling of irritation and itching, like the pain of the scratch and nettle-sting combined.

I must not omit to observe that I have never discovered any trace of such influence in any other animal, with one slight excep-

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tion; a deep scratch on my arms with the claw of a rabbit has, in two or three instances, produced the same sensation and appearance as those above described, only less clearly developed.

The saliva of a cat is perfectly innocent, and a bite with the tooth in no way differs from ordinary wounds of the same character; in a word I believe the influence is, in its source, exclusively cutaneous.

Asthma from bronchitis in adult life.—Capricious and curious effects of locality.—Physical signs.—Inoperativeness of all remedies.

—— H., Esq., living near Kidderminster, applied to me in July, 1859, on account of spasmodic asthma. He was quite well up to last October, when he caught a severe cold on his chest, with soreness beneath the sternum, cough, and expectoration, but he did not lay up, nor did he seek medical advice. Finding in the following January that he was getting worse, he applied to his medical attendant, who told him that he had been, and was then, suffering from bronchitis. He experienced, I think, but little benefit from treatment. It was not till February that the asthma showed itself. It came on first in nightly paroxysms, waking him from one to two o'clock in the morning. Finding this new symptom increasing upon him, he consulted Dr. ——, of Birmingham, who told him it was spasmodic asthma. Dr. —— did him little, if any good. He then went to St. Leonards, and put himself under Dr. ——; for some time he got no better, and had his attacks every night; but one day, he says, something snapped in his left side, and he almost immediately began to mend. Dr. —— told him it was a pleuritic adhesion that had given way, and ordered the infriction of mercurial and iodine ointment. For the rest of the time that he was at St. Leonards he was almost entirely well, and fancied himself quite cured. He then went to Malvern, and had not been there ten minutes before his asthma seized him, and he had a very bad attack; as long as he was there his asthma continued, and he therefore very promptly left. After this he came to London to consult Dr. ——, and put up at Wood's Hotel, Furnival's Inn, Holborn, and there was perfectly well. On returning home he was as bad as ever; and coming to Reading was advised by a medical friend there, to come to town to consult me. Mr. H. is a fine, strongly built, and muscular man, remarkably well "fleshed up." Chest movements good; percussion everywhere clear without any emphysematous hyper-resonance; no emphysematous configuration of the chest or back. On auscultating the chest, I find—1, respiration accelerated about twenty-five a minute, I should think; 2, expiration a little prolonged, post-expiratory rest almost lost; 3, respiratory murmur not loud anywhere, but at the apices, and below and behind, decidedly deficient; 4, on forced respiration these parts are found to be the seat of very slight emphysematous crackling, the latter also of a little rhonchus

and sibilus; forced respiration everywhere else gives the normal puerile sound.

The patient goes to bed well every night, at one or two o'clock he awakes up with, or rather is awoke by, severe dyspnœa, and obliged to assume the erect position. After an hour or two the difficulty of breathing gradually subsides, and before it is time to rise he is able to fall back and get a little sleep; but he finds that even these little snatches make him worse, and that he wakes from them with his breathing not so free as when he lay back. He gets up to breakfast, but it is not till ten or eleven o'clock that his breath becomes perfectly free. When I saw him, ten o'clock, that time had not quite arrived. The attack generally goes off with a little expectoration. For some time, for some weeks, I think, he had, besides these nocturnal attacks, a little attack every evening at eight o'clock.

He has taken the following remedies without any benefit: Indian hemp, lobelia, extract of stramonium, camphor, ether, squill, ipecac, and chlorodyne; also the fumes of nitre paper. The thing that he says has done him the most good is a draught containing antimony (not in nauseating doses), ammonia, and ether. He has not tried tobacco, antimony, or ipecacuanha *ad nauseam*, stramonium smoking, nor chloroform.

I ordered him to smoke tobacco *to collapse*, the moment his asthma came on him, the more likely to be easily induced as he has never habituated himself to smoking. Also to try smoking stramonium. Also to get some of Corbyn's ipecacuanha lozenges, and nauseate himself with them when the attack comes on. Also to hold chloroform over his head as a reserve.

This is a case, as it has not been of long standing, and has inflicted no notable organic mischief on the lungs, of the cure of which I should be sanguine. It is one of the cases having an organic origin, being clearly due to the bronchitis. There is no history of asthma or lung disease in his family. He never had any symptoms of it before.

The situation of his house is evidently high and dry. The air, therefore, from which I should expect the greatest good to him, would be low and moist. Either a mild, relaxing marine air, such as Torquay, Ventnor, Hastings, or London near the river, such as Bridge Street, Blackfriars. Such advice I accordingly gave him.

August 20th. This patient has come to me to-day much worse than when I saw him last, and with a very bad account of himself in the interval. He has been to Ventnor, Southampton, and various other places on the south coast, and has not, I think, had one good night. On the contrary, his nights have been awfully bad, and his attacks have generally come on from six to eight in the evening. The dyspnœa also only imperfectly leaves him by day, so that he is constantly troubled with it, and now, as he is talking, I can clearly recognize it. He spits a great deal more—an evidence and a measure of the increased embarrassment of breathing,

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and the consequent pulmonary congestion. He has lost flesh, too, and looks paler and seedy; in fact, he is suffering greatly from want of sleep. As he infers that his recent experience is against a mild and relaxing place agreeing with him, he is anxious to try a bracing one. Accordingly, with my approbation, he is going to North Wales. As he has tried three of Corbyn's ipecacuanha lozenges without any success, I have recommended him to take four or six. I have also advised him to try smoking strong shag tobacco, with the view of producing some nausea.

A week or two after writing the above I heard from this patient that on his way to Wales he had stopped at Leamington, and there had found himself so perfectly well that he had prolonged his stay. He had not had the slightest return of his symptoms. The hotel at which he was staying, "the Castle," was one at which he had on a previous occasion enjoyed excellent nights, when he could not sleep in other parts of Leamington: and, what is still more curious, it was at this very hotel and in the same part of it that another asthmatic patient, who was invariably ill when he left London, had passed, to his surprise, three excellent nights; in fact, been as well as in town. How long Mr. H—— stayed at Leamington, or what has been the subsequent history of his case, I have not been informed.—*Medical News.*

Conservative Medicine as Applied to Hygiene. By AUSTIN FLINT, M. D., Professor of the Principles and Practice of Medicine in the Bellevue Hospital Medical College, and in the Long Island College Hospital.

As the phrase *Conservative Medicine* may be misconstrued, a brief explanation is to be premised. The term Conservatism may be used to express a principle which leads the practitioner, in dealing with diseases, to preserve, develop, and support the vital powers. The unfolding of this principle more and more during the last quarter of a century, has been a result of the progressive increase of the knowledge of the organism in health and disease, together with the accumulating fruits of clinical experience; it is the characteristic of the therapeutics of the present time, as represented by the views of the ablest writers and practitioners, and it is claimed that it should be considered as the governing principle in medical practice. For a fuller exposition, the reader is referred to the previous articles on the subject.*

The subject of conservative medicine, in the articles just referred to, has been considered chiefly as regards its therapeutical relations. The purpose of this article is to consider the subject in its relations to *Hygiene.* Here, as heretofore, the largeness of the subject is

* *Vide* Am. Journ. of Med. Sciences, No. for January, 1863.

such that the writer can only aim, within the limits of a single article, to present a few desultory thoughts which may be suggestive, in the minds of his readers, of trains of reflection leading to important practical conclusions.

Hygiene enters alike into the prevention and management of diseases. The name suggests more especially measures concerned in the preservation of health; but, in therapeutics, all measures, not medicinal, may be distinguished as hygienic. I shall use the term with this breadth of application. And it will be a natural division of the subject to direct attention, *first*, to hygiene in health, and *second*, to hygiene in disease. I will adopt this arrangement.

Conservatism as applied to Hygiene in Health.—There is no need to argue for the validity of the principle of conservatism as applied to the preservation of health. Hygiene, in this application, can, of course, have no object which does not assume to be conservative. To weaken the powers of life, or impair the constitutional strength, is never the design of measures to prevent disease. The violations of the principle which fall within this division of the subject proceed either from ignorance, or false notions as regards the effects of means supposed to be conservative. Violations of the principle are less frequent and marked now than formerly; the progress of conservative medicine is shown in its prophylactic as well as its therapeutical relations; still, examples of not only past, but present non-conservative errors are not wanting.

It is not many years since the notion was prevalent, both within and without the profession, that there is such a condition as an overplus of health. And it was the custom to resort to potent measures to reduce the exuberance of health within safe limits. Bleeding and purging were employed for this end. There are persons now living who were accustomed, in their young days, to get bled from time to time purely as a sanitary measure. Nothing was more common, a quarter of a century ago, than for healthy persons to apply at the offices of physicians for a venesection, which was performed, as a matter of course, on the judgment of the applicants. Such occurrences are very rare at the present time. Purgation, being practicable without the aid of the doctor, was almost universally employed as a health-preserving duty. Cathartics were regarded as cleansing agents, and not less important for the alimentary canal than soap for the surface of the body. An occasional internal "scouring" was supposed to be even of greater importance than a thorough external scrubbing, for while the latter was enforced chiefly on the score of cleanliness, the former had the additional recommendation of being thought to be essential to the welfare of the system. There are many now in middle life, with whose reminiscences of childhood are associated periodical doses of sulphur and cremor tartar mixed with molasses, given regularly for a series of days, before breakfast, or at bedtime, especially at every recurrence of the vernal season. This was the cleansing mixture for healthy persons of tender age. After this period, the so-called

cooling purgatives, such as the Glauber and Epsom salts, had preference. A person with an excess of health was considered to be on the threshold of disease, and the latter was supposed to be warded off by the timely employment of the lowering, cleansing, and cooling measures just referred to. The popular use of purgatives or prophylactic agents is still sufficiently common.

Gestation is a physiological, not a pathological, state; and since it is by no means a modern discovery that all the needful supplies for the development and growth of the fœtus are contained in the maternal blood, a common-sense view of the matter, it would seem, should have led to the conclusion heretofore, as now, that pregnant women cannot well afford to lose blood; yet, a few years ago, pregnancy was supposed, as a matter of course, to call for repeated bloodlettings. The physician who declined to bleed a healthy person desirous of losing blood simply on the score of pregnancy, had often a task in trying to remove the disappointment which his refusal occasioned. Venesection, under these circumstances, was deemed an important sanitary measure. How such an absurd notion arose, I will not stop fully to explain. Briefly, it was a result of theoretical views respecting inflammation, views which led to the conclusion that the great source of danger, as regards the development of disease, was a redundancy of the vital fluid. How different the practical views of the present time, based on the belief that paucity and impoverishment of the blood are conditions often giving rise to, and standing in the way of recovery from, a variety of diseases!

As another example of the violation of conservatism, may be cited the custom with many surgeons, formerly, to prepare the system for important operations by lowering the powers of life. For this end, a course of purgatives, a system of reduced diet, and sometimes a venesection, were deemed important. This custom does not seem to be entirely exploded at the present time. In like manner, if there were good grounds to expect the speedy occurrence of any disease, as, after exposure to contagious fevers, during the period of incubation, a similar plan of impairing health, by way of preparation for the disease, was considered to be a prudential measure.

Now it may be laid down as a rule of prophylaxis, that, other things being equal, disease is less liable to occur in proportion as the health is perfect and the vital powers high in the scale of strength. This rule may not invariably hold good. Some of the special causes of disease, among those styled zymotic, appear sometimes to luxuriate in vigorous organisms; but if there are exceptions, they do not subvert the rule. If this be true, it is a correlative truth that everything which impairs health or depresses the vital powers, favors the occurrence of disease. Observation and common sense warrant the adoption of the latter truth as a maxim of conservative medicine. Akin to the foregoing rule is another, viz., the system is prepared to endure and recover from

disease in proportion to the previous completeness of health and the degree of constitutional vigor. Without having the statistical data to demonstrate this rule, and without denying the possibility of exceptions, observation and common sense warrant its adoption as a maxim of conservative medicine. Let us, then, inquire whether among the existing notions or customs having reference to hygiene in health, there be not some which are inconsistent with the foregoing conservative maxims. I do not mean to inquire concerning those palpable violations of the laws of health which every reflecting person recognizes as such, and which are common enough. My proposed inquiry relates to false views respecting the means of preserving health or warding off disease; in other words, instances in which persons suppose they are doing right when, in fact, they are doing wrong. It will not be difficult to find examples of this kind.

The wear and tear incident to untiring activity in the pursuits of life first suggests itself. In this country the evils springing from false notions and customs, relating to the exercise of the mental and physical faculties, are enormous. A young man enters upon active life, with injunctions to push his industry to the utmost limit of his capacity of endurance; he is incited to constant exertion by the examples of others; he is stimulated by his ambitious aspirations or a conscientious desire not to be wanting in the discharge of his duties; his position and responsibilities, in the existing state of society, may seem to render excessive and unremitted assiduity imperative. He may or may not violate the laws of health in other respects. If he be regular in his habits, temperate and moral, he is encouraged on every side by approving friends; he is held up as a model for imitation; he looks upon himself with self-complacency; and yet, he is advancing steadily onward, perhaps, to the accomplishment of the great objects in life before him, but with greater certainty to a condition of impaired health, with the mind weakened or disordered, and a proclivity to any disease to which there may be a predisposition. All physicians, especially those who practice in cities and large towns, well know that there is a class of patients who suffer from the want of health, without having any disease which has a place in the nosology. The morbid state in these cases has been gradually induced, and many suffer without appreciating the fact that their state is morbid, and, therefore, without making application for medical aid. They feel a deficiency of their accustomed energy and buoyancy, their interest in persons and things flags, their appetite fails, they lose strength, and they are depressed, without any apparent reason, or by causes which, in a condition of health, would disturb the mind very little. These are the early effects of wear and tear, due to overtasking, not the physical powers alone, but, conjunctively, the mental faculties. Of the cases of chronic diseases, such as tuberculosis, Bright's disease, diabetes, etc., how large is the proportion in which the previous history shows the

existence of wear and tear for a greater or less period prior to the development of the affection? This would be an interesting point for statistical research, but we need not wait for the results of statistics to know that the proportion is large. And of the cases of acute diseases developed in persons suffering from wear and tear, how much of the fatality is due to the diminished power of resistance incident to the antecedent morbid state! How many would probably escape the development of acute disease were it not for this morbid state!

These considerations, while they are of vast importance, should not militate against a proper degree of attention to the objects in life. They do not show that either physical or mental activity is unfavorable to health. The reverse of this is undoubtedly true. As regards the mind, it is not the intensity of the exercise of the faculties which involves wear and tear. It is the long-continued. unrelaxed efforts, accompanied by unceasing anxiety and strain, which tell upon the system. The physician, oppressed by the weight of his professional cares, is well aware that it is not the demand for the operations of the intellect which bears heavily upon him, so much as the pressure of the sense of responsibility inseparable from his duties. It is not the frequency or force with which the bow is bent, but the constant tension, which destroys its elasticity and renders it worthless. Unremitted exercise of the mental and physical powers, although they are not overtaxed, cannot be indefinitely borne; sooner or later the system will break down. Here is a truth difficult to appreciate in its personal application; but every one recognizes it in its application to the physical endurance of inferior animals. A horse, never overworked, and in all respects well cared for, after a time must be turned out to grass. The prudent owner sees this clearly enough, and acts accordingly, while he fails to see that what is true of his horse is not less true of himself. Many persons pursue a course with respect to themselves which they could not pursue, without remorse, toward a beast of burden. It appears to be a part of the egotism inherent in some persons to think that they are so constituted as to bear an unlimited duration of steady work. Next to this is the folly of supposing that the powers of the system, when they give way, may be restored by medication. And when, at length, they find that they are not exempt from the laws pertaining to all animal, as well as human bodies, they perhaps discover, too late, that the influence of habit has rendered continuance of labor essential to happiness. Fortunate are they who, without sacrificing aught that belongs to a proper degree of assiduity in pursuing the objects of life, have taken care to preserve the capacity for healthful recreation!

It is a curious notion, which physicians sometimes inadvertently sanction, that mental and physical exertions are compensatory as regards each other. The man who is overworking the brain, seeks to make amends by fatiguing the muscles. It has occurred to me repeatedly to meet with persons who were devoting too large a

number of hours daily to labor of the mind, and who imagined that this may be done with impunity, provided a certain amount of muscular exercise be added. A lawyer, for example, who habitually devoted ten or twelve hours a day to intense intellectual occupation, became sensible that he was tasking unduly his mental powers, and, in order to fortify his health, moved out of town, and managed to ride on horseback from ten to twenty miles each day. Under the combined effects of the exercise of mind and body, as might be expected, he was losing ground rapidly. It is clear that exhausting mental labors will be longest borne in proportion as the time not thus occupied is devoted to physical, as well as mental, repose; and, on the other hand, that too much physical labor will be less hurtful in proportion as it is not conjoined with activity of mind.

Violations of conservatism, hardly less flagrant, in the hygiene of health, relate to diet. Both the profession and public have been sufficiently alive to the subject of gluttony. The evils of overfeeding, as regards the production of disease, have undoubtedly been exaggerated. The injurious effects of gormandizing habits are mental and moral, rather than physical. So far as health and prophylaxis are concerned, false notions in an opposite direction have been productive of more harm. A quarter of a century ago, dietetic abstemiousness was considered to be the alpha and omega of hygiene. The world was eating too much; hence, the ills that flesh is heir to. So believed not only physicians, but the non-medical health philosophers. The great conditions of health were supposed by many to be the minimum quantity of food with which life could be supported, as little variety in the articles of diet as possible, coarseness in quality, and rejection of most of the accessory aliments. Some advised, as a security against errors of quantity, to regulate each meal by weight.

Vegetarianism had not a few apostles and disciples. We have heard a transcendental reformer contend that in assimilating meat the natural characteristics of the animals were necessarily appropriated; that is, pork communicated to man the attributes of swine, and so of beef, mutton, veal, etc. All the refinements of the art of cooking were deprecated as tempting to over-indulgence.

The sense of taste was deemed a fallacious guide in the selection of articles of diet, and the appetite was so unsafe as a criterion of sufficiency, that the injunction was always to rise from the table hungry.

It was considered a wise course to watch carefully the progress of digestion, so as to ascertain after every meal whether any imprudence had been committed. The subject of dietetics was discussed, not only in medical writings and in intercourse with physicians, but it entered largely into popular literature; it not only pervaded table-talk, but ranked next to the weather in common conversation; public lecturers made no small account of it, and it was not overlooked in the pulpit. In short, the zeal in behalf of abstemiousness

in diet amounted to fanaticism. And dyspepsia was the most common of all ailments among the intelligent and cultivated classes, while it was rare among those who, without thinking of dietetics or digestion, satisfied the appetite with the food placed before them. There is reason to believe that the fanatical notions just referred to, not only contributed to the prevalence of dyspeptic disorders, but favored, in no small degree, the development of other and graver affections, by impairing health and lowering the vital powers.

These notions are by no means yet obsolete either within or without the profession. There are many now who fancy they promote the welfare of body and mind by habits of diet which are incompatible with the highest degree of mental and physical vigor. There are physicians who sanction such violations of the hygienics of health. It is still considered by not a few to be gross and unrefined to eat heartily Especially with the other sex, it is deemed a ladylike accomplishment to have a delicate appetite, and abstain from the more substantial articles of food. There are fashionable boarding-schools where, as a part of the educational discipline, girls are placed under dietetic restrictions which, in a measure, explain the imperfect development, the anæmia and feebleness of constitution of those who are preparing to become wives and mothers. It is not yet sufficiently appreciated by all, that the *mens sana in corpore sano* is best secured by nutritious supplies abundant and varied; that the healthiest, ablest, and best men and women have been good feeders; that an excess of ingesta over the absolute wants of the economy is not necessarily an evil, there being provisions made for the disposition of an overplus, but none against a deficiency of aliment; that generous living, constituting an important part of the management of certain diseases, *e.g.*, pulmonary tuberculosis, must be also important in preventing their development; that hunger, appetite, and taste were designed to govern dietetics, and are adequate to their office; and that personal experience derived from watching the progress of digestion is extremely fallacious. There is still, therefore, scope for the progress of conservatism in this direction, in order to meet the requirements of existing knowledge and of common sense.

With these few remarks on conservatism as applied to hygiene in health, I pass to the second division of the subject.

Conservatism as applied to Hygiene in Disease.—The importance of the hygienic management of diseases has not been, and is not, adequately estimated, for two reasons: *First*, because hygiene in its relations to health has been imperfectly understood and is not sufficiently appreciated; and, *Second*, too great reliance has been placed on medicinal measures of treatment. It is only within late years that the profession has begun to be awake to the vast importance of the study of the laws of health. Sanitary science is yet in its infancy, and claims far more interest and attention than it now receives. The main dependence, hitherto, in the management of diseases, has been on the curative influence of remedies.

That many diseases, under favorable hygienic circumstances, intrinsically tend to recovery, is a fact but recently known and still too little considered. The mind of the physician is too often engrossed with the inquiry, "What drugs shall I give to effect a cure?" and, hence, he frequently loses sight of another inquiry, often of far greater consequence, viz., "What hygienic regulations will contribute to the recovery of the patient?"

This division of my subject has diverse relations. In one aspect it relates to the various hygienic circumstances embraced under the heads of diet and regimen; the latter comprehending influences affecting not only the physical but the mental and moral being. In another point of view, it relates to different diseases, the different stages of disease, and the numerous circumstances which are incidental to disease. I cannot undertake to treat of this more than the former division of the subject with any approach to completeness, or in a systematic manner. I shall only offer a few desultory thoughts, and I will consider first the topic which was last considered in the former division, viz., *diet.*

A striking improvement in the practice of medicine, of late years, relates to diet. Physicians have learned to appreciate, more than formerly, the value of supporting treatment in fevers and other acute diseases, and to regard alimentation as an essential part of this treatment. They have also learned that it is a great object in various disorders and chronic affections to build up the powers of the system, and that this is to be done by conjoining with other measures nutritious food. Has improvement in this direction reached its limit? Is the extent to which alimentation should enter into the management of diseases, fully appreciated? Let us see if there be not ground for answering these questions in the negative.

Limiting attention to acute diseases, it is now generally understood that they do not stand in the way of dying from starvation. Graves uttered a literal fact when he said that patients with continued fever, treated without nourishment, may be starved to death. And this fact is equally applicable to other acute diseases. That a fatal result may take place, and not infrequently has taken place, not from an existing acute disease *per se*, but from inanition, will not be denied. Now it is only an extension of this fact to say that more or less of the morbid phenomena pertaining to the progress of acute diseases are due to a suspension or impairment of the processes involved in nutrition. If patients affected with acute diseases may die from inanition, the latter must play an important part in the production of the phenomena manifested in connection with the diseases; and this must be true of cases which end in recovery as well as of those which terminate fatally. Deficiency of assimilation originates the symptomatic phenomena, in acute diseases, to a greater or less extent, and here is a source of danger in a greater or less degree. In other words, the symptoms which represent the condition of a patient affected with an acute disease,

spring, in part, directly from the disease, and partly from the want of appropriation of fresh supplies for nutrition. Innutrition, in a pathogenetic point of view, has not been sufficiently considered. There is reason to believe that it forms a constant, and often a very important element of all acute diseases; and the practical bearing of this fact is of great importance.

It is fair to presume that the effects produced in a healthy person by withholding food, may also result from the want of nourishment in disease. If starvation be not less fatal in the latter case than in the former, the morbid phenomena, it may be reasonably supposed, are essentially the same in both cases. In order, therefore, to judge of the extent to which the symptoms of disease are attributable to innutrition, the clinical study of starvation in health is important. Experimental observations in inferior animals are not altogether satisfactory, in consequence of the difficulty of appreciating certain symptoms. Nor are the instances of human beings starved from necessity, as in shipwreck, suited to the purpose, because the effects of the want of food are mixed with the moral influences incident to their situation, and, moreover, in such instances, generally, there is a deprivation of water as well as food. Experiments voluntarily made are to be preferred; and of these the best to which I am able to refer are those made by Hammond, to establish the relative nutritive value of albumen, starch, and gum.* Subjecting himself to the trial of restricting his diet to these alimentary principles singly, Hammond found that they were incapable of supplying the wants of the system, and that the two latter were absolutely innutritious. During each experiment certain phenomena were produced. Now, these phenomena, for the most part, certainly were not produced by the alimentary principle taken, but resulted from the absence of other alimentary principles, or, in other words, from innutrition. These experiments, therefore, may be taken as illustrative of the morbid effects of starvation, effects occurring in disease as well as in health. In this point of view they are not only interesting, but of great value. Referring the reader to the essay for fuller details, I will simply mention the symptoms entering into the concise descriptions by the experimenter.

1. Under a diet consisting of pure albumen for ten days: Febrile movements, heat and dryness of skin, headache, loss of appetite, nausea, abdominal pains, progressively increasing debility, serous diarrhœa, want of sleep.

2. Under a diet of pure starch for ten days: Debility, disturbed sleep, sense of oppression of chest, palpitation, headache, slight scratches of the skin showing tendency to inflammation and suppuration, febrile movement, abdominal pains.

3. Under a diet of gum, which he was able to continue only for

* *Vide* Physiological Memoirs, by Wm. A. Hammond, M. D., Surgeon-General U. S. Army, etc., 1863.

four days: Abdominal pains, disturbed sleep, headache, febrile movement, diarrhœa.*

Can it be doubted that these symptoms occur under similar conditions as regards diet, in the course of disease? And, if so, how often are these symptoms, presenting themselves in the course of disease, referable, measurably or entirely, to innutrition? I cannot dwell upon these inquiries. I must leave them, reiterating the belief that while, under erroneous views, physicians have been accustomed to regard the ingestion of nutritious food during the course of acute diseases as fraught with evil results, more or less of the morbid phenomena supposed to belong directly and exclusively to the existing disease proceed from defective assimilation.

The practical conclusion based on the statement just made is obvious. It is an object in the management of acute diseases not to withhold nutriment, but to promote the assimilation of nutritious supplies. In many diseases this is *the* great object in the management, taking precedence of any known curative remedies. The object always exists, but the extent to which it can be accomplished varies according to the nature and seat of the disease, together with a host of incidental circumstances. The object is the basis of a principle which may be laid down as applicable to the treatment of all acute diseases, viz., alimentation is important to the fullest practicable extent. It is always desirable for a patient affected with any acute disease to take as much food, embracing a proper variety of alimentary principles, as will be appropriated. Inconvenience and evil results may doubtless follow the ingestion of aliment beyond the powers of digestion and assimilation; but the risk of injury from this source, with the exercise of a fair amount of prudence, is less than the liability of harm if, from an excess of caution, the patient suffer from starvation. The minds of physicians have been too exclusively directed to the harm which may possibly be done by overfeeding in acute diseases, and they have overlooked the greater harm of failing to furnish supplies which may be digested and assimilated notwithstanding the existence of disease.

A wide field is opened up by the practical application of this principle. It involves the encouragement of a desire for food instead of the discouragement caused by needless apprehensions. The desire for food may often be developed by judicious contrivances; the appetite may be fostered, on the one hand, or, on the other hand, destroyed by circumstances connected with the selection, preparation, and administration of articles of diet. Giving

* For a full account of the effects of starvation on the different organs and functions, and for references to the literature of this subject, the reader is referred to the *Cours de Physiologie*, par P. Berard, tome premier, pages 517 *et seq.* The following quotation, by this author, from Chossat, embraces a fact which has to a great extent been overlooked: "*L'inanition est une cause de mort qui marche de front et en silence avec toute maladie dans laquelle l'alimentation n'est pas a l'etat normal.*"

medicines too frequently, and the use of nauseous or nauseating remedies, may do harm by compromising the desire for food and appetite, which their remedial effects will not compensate for. The mental condition may conflict with a disposition to take food, when, if taken, it will be digested and assimilated; this is true of the continued fevers, and other diseases accompanied by a typhoid state. In such cases food is to be given without regard to the desire or appetite; the condition of the digestive organs, and the results of experience from day to day, are of course to be considered. These are some of the numerous circumstances affecting alimentation as a measure of management in acute diseases. I must content myself with this allusion to them. But in passing from this topic, a word or two with regard to the diet of hospitals. This is generally determined by the supposed wants of the system, without much reference to the choice or wishes of the patient. How much good might be done by selecting, preparing, and serving food to hospital patients with a view not alone to the requisite amount and variety of nutritive material, but to develop, encourage, and satisfy desire and appetite! I have often thought if I had unlimited control of the culinary department of a hospital, I would willingly submit to a proportionate curtailment of the articles pertaintaining to the dispensary.

I cannot find space even to touch upon the various practical points pertaining to the kinds of food suited to the diverse circumstances incident to different diseases; and I will only add, lest some of my readers may imagine what I have written on the dietetic management of acute diseases to be purely speculative, that the views now presented are based not only on reasoning believed to be sound, but on considerable experience. This experience would have been larger were it not that traditional ideas fixed in the public mind, as well as still prevailing in the profession, render it difficult often to carry out an efficient plan of alimentation in private practice; and in hospitals this part of the treatment is limited by circumstances which the physician cannot control. Prejudices, professional and popular, against air and water in the management of acute diseases, prevailed until within a recent period, and are by no means now obsolete. The antipathy to feeding patients will in time appear as absurd as to deny drink and disregard ventilation.

The foregoing remarks have had reference to diet in acute diseases. The importance of ample alimentation in chronic affections is better appreciated, but there is room here for further improvement. I shall content myself here with a maxim of conservative medicine, quoted from my first essay on this subject: "Under all circumstances, a chronic affection is less likely to be prolonged, serous lesions of structure are less likely to take place, and a fatal termination is postponed, in proportion as the vital powers are preserved." I need not stop to argue that the vital powers are to be preserved by a nutritious diet conjoined with other hygienic measures.

I have just now alluded to *air* as an element of hygiene in disease. Of the various hygienic conditions, perhaps to none has attention been more directed, of late years, than a sufficiency of breathing space and adequate ventilation. There is room, however, for the inquiry whether improvement here has reached its limit. Granting the largest estimate of cubic feet, and the best contrivances for the renewal of the air of the ward or sick-room, there is reason to think that additional influences pertaining to the atmosphere may be brought to bear with advantage on the management of diseases. During the present civil war in this country it has been repeatedly observed that the wounded have done better in the open air, exposed to deprivations and vicissitudes of weather, than after having been received into houses or hospitals containing every provision for comfort. Surgeons have found that the most effectual mode of arresting hospital gangrene is to transfer patients at once to tents, and the rapidity of improvement in the latter situation is remarkable. Now, the question arises, may not outdoor exposure, or what is equivalent thereto, be useful in many acute diseases? Its usefulness in chronic affections is acknowledged. This question is worthy of consideration with a view to experimental observation. It would not be surprising if patients affected with fevers and acute inflammations were found to improve in a notable degree under the freest possible exposure to air. As to the choice between such exposure and insufficiency of space and ventilation, there is, of course, no question. There are facts enough bearing on this point. But the question is whether such exposure may not be advantageously added to the observance of the usual sanitary requirements respecting air. Free and daily exposure is important as a means of preserving the vigor of the body in health; may it not be equally important as a means of keeping up the vital powers in disease? Every one accustomed to spend much time in hospital wards, must be aware of the sense of debility felt after remaining there for even two or three hours. How different the feeling after having been in the open air for the same period! How would the strength and energy of mind and body flag, if an active, healthy man were confined for successive days and weeks to an apartment, with the air sufficiently renewed to preserve its purity, but kept steadily at a uniform warm temperature! How refreshing would be cool breezes and alternations of heat and cold after such a confinement! Do not these facts apply to the body and mind in disease as well as in health? As a general rule, the hygienic circumstances required by conservatism in health are not less important in disease; and it is at least highly probable that, as respects the depressing effects of confinement in heated rooms on the one hand, and the invigorating effects of free exposure to air on the other hand, sanitary laws are applicable alike to disease and health.

As bearing indirectly on this topic, I may refer to instances of persons passing safely through fevers and acute inflammations, in situations in which they are necessarily exposed to atmospherical

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vicissitudes. For example, I have reported a case of pneumonia affecting one entire lung, the patient living entirely alone in a shanty, in the winter season, in Louisiana; the shanty in a swamp, the floor of earth covered with water; his subsistence consisting of bread and water with a bottle of whisky, and the evacuations passed in bed. The patient was discovered and removed from this situation to the Charity Hospital of New Orleans already convalescing, and he rapidly recovered. I have known a patient affected with pneumonia escape from the ward in a state of delirium during the night, in the winter season, wearing only a cotton shirt, and walk a distance of two miles to a house where he had formerly lived. He was brought back to the hospital the next day, free from delirium, and he convalesced rapidly, having received no detriment from this great amount of exposure and exertion. Examples analogous to these occasionally fall under the observation of all practitioners. They show, at least, that prevailing apprehensions of danger from exposure to atmospheric influences, during the progress of acute diseases, are much exaggerated. This remark will apply to early gestation in convalescence from acute diseases. It was formerly supposed that most acute diseases left behind them a liability to relapse, or a condition favorable for the development of other affections; and, therefore, that great care must be taken to avoid all exertion, and especially the morbific agency imputed to cold. A better knowledge of the natural history of diseases has taught us that, as a rule, there is little or no tendency to relapse, and that the sequels of certain diseases proceed from intrinsic tendencies. Of the hygienic circumstances favoring rapid and complete restoration to health, getting up as soon as the strength will permit, and gentle exercise in the open air, are among the most efficient. I could cite illustrations of this fact in abundance. As I am writing, a striking instance comes to my mind of a fellow-practitioner who had kept the bed for a long time with chronic pleurisy, accompanied with great debility and emaciation, and, finally, bed-sores were added to his sufferings. At this juncture he was taken out of bed, placed in a carriage, and driven a short distance. The effect on body and mind was such that the experiment was repeated. He continued to ride out daily, and rapidly recovered. This was many years ago; he is now in good health and in active practice. This is a striking instance among many exemplifying the hygienic importance of air and exercise in determining convalescence and promoting recovery.

Are the requirements of conservatism fully met by a due appreciation of all that pertains to mental hygiene in disease? This question will lead to a few remarks which will conclude my brief consideration of conservatism as applied to hygiene in disease. Physicians are not unmindful of the reciprocal influences of mind and body. It would be trite to assert their existence and importance. They are patent to every medical observer. But it is perhaps true that mental conditions are more largely concerned in

either favoring or antagonizing disease than is generally supposed; and, hence, that the therapeutic value of hygienic influences acting primarily on the mind are not sufficiently appreciated.

It is obvious that the capacity of resisting and recovering from disease varies in different persons. The same disease, having apparently the same intensity, will destroy some and not others. And there is a wide difference as regards the duration of life with a similar amount of incurable lesions. Take, for example, pulmonary tuberculosis, how great the diversity in the extent of destruction of the lungs in cases in which this disease alone has produced death! Now this intrinsic power of overcoming disease, and of living on with irremediable affections which will sooner or later prove fatal, is not altogether vital, but in part mental. If the faculties of the mind be not impaired or obscured by disease, the patient is rarely indifferent to its progress or the result; it is accompanied by more or less emotional activity. Much, often very much, depends on the character of the predominant emotions. Hope, confidence in the physician and the means of cure, reliance on the wisdom of Divine Providence, are sentiments which sustain the vital powers and are conservative. On the other hand, discouragement, apprehensions, dissatisfaction, impatience, depress the vital powers and are non-conservative. The character of the predominant emotions will, of course, depend in a great measure on mental constitution, education, habits of thought and feeling, etc., with reference to which there is nothing like uniformity in different persons; but judicious management on the part of the physician may determine their character to a greater or less extent. The ability to secure complete confidence, to exert an influence over the minds of patients, enhances, in no small degree, the skill of the physician. As belonging legitimately to the practice of medicine, this is not enough considered. But the skillful exercise of a moral power requires accuracy of diagnosis and knowledge of the laws of disease. If the physician be not able to judge correctly of the situation of a patient, he cannot give the assurances which the nature of the case may warrant; prudence, as regards his own reputation, dictates great reserve, and he depresses his patient by non-committalism. In a dispensary practice limited to affections of the chest, I have been forcibly impressed with the good which may be done in many cases by simply declaring *ex cathedra* the absence of consumption or an affection of the heart. Poor patients, after having perhaps suffered long from secret apprehension of serious disease, come tremblingly, at length, as if to hear their doom pronounced. Thanks to the invaluable methods of physical diagnosis, the healthy state of the thoracic organs may be positively ascertained. How delightful to witness the transition from despondency to joy, when soundness of the suspected organs is announced and believed! The moral effect is often of more efficacy than any medicinal remedy. It would be easy to cite numerous instances of mental suffering with physical disorder persisting many

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years, for the lack of an authoritative assurance of the non-existence of a fatal malady.

It does not enter into my plan to discuss the various means by which mental influences may be brought to bear on the management of diseases. I wish only to bring forward the fact that here is an important province of conservative medicine. A topic suggests itself in this connection which I will not pass by, because it relates to a matter concerning which the opinions and conduct of medical men differ: I refer to the co-operation of the clergy in cases of disease. Some physicians take the position that during the progress of diseases involving danger to life, the ministrations of religion are liable to interfere with recovery by producing excitement and discouragement. I desire to bear testimony against this position. Divesting the topic of all considerations save those which relate to the influence upon the progress of the disease, experience has led me to have no fear of harm from the timely and judicious offices of clergymen and religious friends. On the contrary, the effect is often manifestly salutary.

If the mental functions remain intact, every patient must think of the probability or possibility of an existing disease ending fatally. There can be no stronger evidence of an imbruted mind than the absence of all thought of danger. And the doubt, uncertainty, and anxiety engendered by the patient's reflections occasion a more depressing effect than even a definite expectation of a fatal result. Every physician knows how common it is to be entreated by the patient to make known to him his actual condition, to tell him the worst, a painful state of suspense with respect to death, as well as any event involving a deep personal interest, being more difficult to bear than its anticipation. For this reason, although a certain amount of reserve may be allowable, the physician should, as a rule, meet the demands of the patient for explicit information with candor, and he should never violate the truth. The most favorable condition of mind, in a hygienic point of view, is that induced by confidence and hopefulness in union with a cheerful resignation to the will of God. In so far as the services of the minister of religion conduce to the latter, he becomes the coadjutor of the physician. Irrespective of life and health, this topic has relation to momentous interests which would be here out of place, even if the writer were presumptuous enough to consider them. I wish simply to record the opinion, as a physician having had considerable opportunity for observation, that so far from there being any ground for antagonism, the minister of religion may effectively co-operate with the medical practitioner in behalf of the physical welfare of the sick.

Attention to mental hygiene in hospitals often falls short of the requirements of conservatism. The violations of conservatism, in this regard, consist, in the first place, of circumstances which tend to depress the vital powers by their influence on the mind, and, in the second place, in the absence of circumstances influencing the mind in an opposite direction. Obvious sources of a depressing

influence are apt to be overlooked. One of these is the necessity of witnessing the distressing manifestations of disease in other cases in the same ward. Cases which, from their character, shock or painfully excite the feelings, should, as far as possible, be isolated. To be confined in the same apartment, or perhaps to lie side by side with patients in a state of active delirium, or affected with convulsions, or in stertorous coma, or suffering extreme pain, is to be exposed to a depressing influence which one can best appreciate by imagining himself in such a situation. It is melancholy to think that a brutish insensibility is often the only resource against this influence. It is cruel to compel hospital patients to witness the phenomena of the dying act. How often have I seen the most marked evidence of the unfavorable effect of a prolonged agony in a hospital ward! If it be true that the patients may become habituated to these scenes, so as to regard them with indifference, is this a result to be desired? The propriety of assigning wards to tuberculous cases, or to incurable diseases, is more than doubtful as a measure of mental hygiene. What can be more discouraging to a tuberculous patient than to be surrounded with cases presenting all the different phases and gradations of consumption? For this reason consumptive hospitals are objectionable.

The circumstances just referred to may not be under the control of physicians connected with hospitals, but there are circumstances for which medical officers and visitors are exclusively responsible. It is very rarely the case that hospital patients are treated cruelly, roughly, or neglectfully; but the fact of their having the same faculties of thought and the same sensibilities as private patients is not always suffiently borne in mind. If this fact were not sometimes forgotten, the nature of the disease, the prognosis, and the appearances which may be expected to be found after death, would never be discussed without reserve at the bedside of a patient; the chances of recovery or death in the cases under observation, the incidents of the dead house, and other topics of a like character, would not enter into conversations held in the wards. It is but just to say that such breaches of conservatism are by no means common, and that when they do occur they proceed generally from the thoughtlessness incident to youth and preoccupation.

There is room for improvement as regards mental hygiene in hospitals, not only by obviating circumstances which exert a depressing influence, but by trying to call into exercise thoughts and feelings which have a salutary effect in disease. It is a great charity to institute for the sick poor places of refuge, furnishing shelter, nourishment, nursing, and medical aid; and for many of the miserable candidates for such a charity, a hospital ward offers comforts far beyond those to which they have been accustomed. But supplying these needs does not fulfil all the requirements of relief: sympathy, encouragement, and religious ministrations may be added with advantage in a sanitary point of view, irrespective of other and higher objects. For this part of the hygienic man-

agement the physician must depend in a great measure on others. And here is a field for philanthropic labor which lacks husbandmen. How few of the many who are earnest to benefit their fellows think of the sick and friendless poor in hospitals, where, by judicious words and offices of kindness, they might reap a harvest of good works, of which least in importance, although important, is the favorable influence on the course of disease! But I am entering on a train of thought which, for the medical reader, offers nothing new and is not called for, and I therefore here rest my remarks on hygiene in disease.—*Am. Jour. Med. Sciences.*

[From the American Medical Times.]

Gunshot Wounds of Joints. By DE WITT C. PETERS, Asst. Surg. U.S.A., Surgeon in charge of Jarvis General Hospital, Baltimore, Md.

The investigation and study of these injuries are at the same time the most interesting and perplexing that come under the observation of the military surgeon of the present day. The rule to amputate or even to resect a joint because it has been complicated by a gunshot wound, meets often in our practice with important exceptions. In General Hospitals, where we usually see our cases in a secondary condition, wounds of great joints require only the laws of conservative surgery to be employed in their treatment, when the results will frequently prove most gratifying. In these remarks it is not my intention to review the vast subject of these injuries, but I shall simply give my opinion in the management of several of the individual joints when wounded by missiles. At the shoulder-joint the complication may rest solely in exposing and opening to a greater or minor degree *the synovial membrane*, or we may have a compound comminuted fracturing of the bone entering into the formation of joint. There is still another class of cases where the ball (especially if it be a small-sized one) passes directly through the head of the humerus without either splitting or materially disturbing the general contour of the bone. From the battlefield of Gettysburg an interesting case of this latter series was sent to this hospital. The soldier had been wounded in the left shoulder, and, on admission, the joint and surrounding tissues were found greatly distended by healthy pus, the exit of which was partly prevented by the valvular condition of the posterior and lower wound. An operation was deemed necessary; the man was placed on the table and etherized, with the view of first making an exploration and then accomplishing what nature seemed to indicate. A straight incision was made in the course of the deltoid muscle, commencing at the acromion process and extending down-

wards for the distance of about three and a half inches. The incision gave free vent to a large quantity of pus and revealed the nature of the injury, viz: there was a direct opening through the head of the humerus and no true fracture. The parts were left open and dressed with simple dressings, and it has nearly healed at the present time, with every indication that the man can be again returned to active service. In all cases of wounds of the great joints we have attempted to save the limbs, with what success the annexed table will show. If the bones are comminuted a free incision is made in a favorable position; all fragments are removed and sharp spicula are trimmed with the bone forceps. The wounds are afterwards treated with the expectation of gaining a false joint, or at least anchylosis. The amount of bone resected depends on the amount of primary injury, always trying to save as much bony material as remained sound in the first instance. Our resections, therefore, are not governed by any general rules, but rather by the nature of the injuries. In a few instances the damage to the soft parts, vessels, and bony structure, has been such as to require amputation. In these cases the external appearance of the joints has been such as, by inspection, to warrant a belief that the limb might be saved, whereas the explorative operation has decided the case adversely. The probe and finger may fail (when the parts are greatly swollen and the openings small) to give us a correct idea of the state of the internal condition; but a few incisions decide the matter, and by removing the fragments, which will certainly die, the surgeon accomplishes his purpose. In speaking of gunshot wounds in general, Stromeyer justly remarks that "those cases proceed the best which are not meddled with. It would therefore appear that haste of the surgeon to do something is not always of service to his patient." This I conceive to be the error, if we are tied down by any set rules (either to amputate or resect) which are for the time-being customary. A friend of mine (Kit Carson), who has been a hunter of repute in the West for many years, received in a skirmish with the Black Feet Indians, a gunshot wound of the left shoulder, which completely shattered the bones of the joint; without any attention, save such as his unprofessional comrades could give him, he recovered. On examination years afterwards I could see the cicatices, and found the head of the humerus enlarged and irregular in shape, yet by use he had overcome all obstacles and had regained the free use of the joint. Had he been seen by a surgeon when wounded, an operation would have been recommended, but certainly under it his case could not have terminated more successfully. The exposing of the cavity of any joint is a grave injury, for we all know the alarming symptoms that are prone to follow; but it appears to me that the danger is not so much due to the entrance of air as to allowing pus to be so closely confined, for the wounds of joints are in the majority of cases small, and the pus as it forms does not escape freely. Sir Benjamin Brodie recom-

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mends free incision in these cases, and my own observation has convinced me of the correctness of his conclusions. After the battle of Gettysburg we had quite a number of wounds of the knee and elbow joints, which we treated by free incisions (where indicated), rest in an easy posture, loose dressings, and constant irrigation by means of the syphon. Our men were much broken down by hard service, and had a tendency to scurvy. Notwithstanding these disadvantages they have progressed favorably, In a very few instances they have terminated fatally from pyæmia (when the wounds were of the knee-joint); still, to all appearances, for a time, they locally presented the most encouraging symptoms. The fearful omen of a chill was the first indication that warned us of the constitutional troubles we might anticipate, and which invariably terminated these cases in dissolution. The gunshot wounds of the elbow-joint, enumerated in the table, we treated by resting the limb bent at a right angle on a grooved tin spint which had been previously well padded with tow. They were retained in this position by loose bandages, the wounds were kept clean, and the patient, as soon as able, was made to exercise in the open air, and attention was paid to passive motion. The diet of these patients must be generous, and malt liquors are to be ordered them to support their strength. The diet of a soldier in the field is substantial, but it is not sufficiently mixed to be healthy; that is, he does not have the opportunity to obtain his customary amount of vegetables, and it has been found in General Hospitals, where the men are supplied with these articles, that their condition is much improved, and indeed, in most chronic complaints, a wonderful change is worked under their use. The plan of treatment to be adopted in every case of gunshot wound of the knee-joint cannot, for a variety of reasons, be so uniform as in the former series. The patient's feelings are to be consulted as to the apparatus to be used in keeping the limb and joint at rest and free from unsupportable pain. It has been our habit to give preference to either the double-inclined plane or Smith's anterior splint, and when these have not felt comfortable to the patient we have tried with success a sort of cradle where the limb rests at will on strips of bandage made fast on each side to the frame of the apparatus. The wounded part is left open and free irrigation is kept, and as the incisions close, leaving sinuses, these are cleaned daily by injections, and among the best of the latter we have found to be a weak solution of permanganate of potash. The incisions into the joint are only made when the pus accumulates so as to be distinctly recognizable and has no free means of escape. The result we hope for is anchylosis, as a false joint appears interdicted by nature, and in our endeavors to gain this end we pay particular attention to the position of the limb in order that it may be useful to the patient in after life. The cases under consideration are generally tedious in their recovery, and require an equal amount of patience and perseverance on the part of the surgeon in treating them. In the healing of compound

fractures of great joints we have the opportunity of distinguishing the division made by Dupuytren of primary, secondary and tertiary splinters of bone. The first comprise the loose fragments remaining after the injury is received, the second those still hanging to the soft parts, and the third are the result of inflammatory necrosis of the bone. The two former are removed when the operation of resection or partial resection is performed, and the latter is apt to occur as a sequel to the fracture and the operation. The thorough examination of a gunshot wound of a great joint cannot be properly conducted without placing the patient under the influence of an anæsthetic, and in hospital practice sulphuric ether is the safest, and when administered by experienced hands is equally as efficacious as any other anæsthetic. To increase its effects, and render the patient more quickly susceptible to its influence, we have preceded its use by giving the patient to drink two ounces of brandy or whisky. By the following table it will be seen that we have treated on the principles stated in these remarks 149 cases of gunshot wounds of great joints. The success has not been as great as we would desire, yet it is such as to warrant us (in the preseut incomplete state of our knowledge) to a continuance of the same.

Tabular Statement of Gunshot Wounds of Great Joints treated in this Hospital since June 20th, 1862:

	Side of Body.		For what Performed.			Results.								
	Right.	Left.	Gunshot Wound.	Other Causes.	Total.	Returned to Duty.	Furloughed.	Deserted.	Discharged.	Died.	Transferred.	Total.	Remaining under treatment, 1863.	Total.
Wrist....	2	6	8	.....	8	...	2	...	1	2	2	7	1	8
Elbow....	6	6	12	.....	12	1	...	...	...	1	7	9	3	12
Shoulder	24	24	48	.....	48	5	2	1	2	3	32	45	3	48
Ankle....	15	20	35	.....	35	3	1	1	2	2	25	34	1	35
Knee....	26	20	46	.....	46	4	6	2	6	7	16	41	5	46
Total..	73	76	149	.....	149	13	11	4	11	15	82	136	13	149

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[From the American Medical Times.]

Treatment of Gunshot and Penetrating Wounds of Chest and Abdomen by Hermetically Sealing. By B. HOWARD, M. D., Assist. Surgeon, U. S. A. Surg. in Chief Artillery Brigade, Fifth Corps, Army of the Potomac.

No class of cases are so painfully humiliating to the military surgeons as gunshot wounds of the chest. When the call for aid is so peculiarly urgent and distressing the surgeon has been able but to lament his impotence, to hide the wound from view with a simple dressing, and sorrowfully abandon the patient to his fate. It is the appreciation of this that induces me, without waiting for properly arrayed stistics, to write prematurely from the field, and state briefly a plan of treatment which I presume will meet with very marked success, and which has already met with the general commendation of my confrères.

The most formidable symptoms of gunshot wound of the lung, and one or more of which in their proper order produce death in fatal cases, are, *Hæmorrhage*, *Dyspnœ*, and *Suppuration*.

The custom of leaving the wound open is objectionable because it affords a means of outflow as fast as the effused blood reaches its level, and thus favors the continuance of *Hæmorrhage*.

It allows the full force of atmospheric pressure upon the entire surface of the lungs, and thus necessitates *Dyspnœa*.

It admits continually renewed currents of atmospheric air ensuring decomposition of the clot in the pleural cavity with extensive and profuse *suppuration* of a very fœtid character, while it does not provide for its exit until after so great an amount has accumulated as to have caused it to rise above the level of the wound; and after its partial subsidence by overflow the wound again ceases to be available.

Suppose, however, that the wound be perfectly closed, the following will at ance appear among the advantages to be gained.

1st. *Hæmorrhage* is controlled. At the worst the amount of blood lost after the operation cannot be more than would suffice to fill up the unoccupied space remaining in the pleural cavity; the elastic clot resulting, furnishing a styptic par-excellence for the wounded vessels of the yielding lung.

2d. *Dyspnœa* is immediately relieved upon removal of the atmospheric pressure, and the restoration of the parts approximately to their normal condition.

The inclosed volume of air being absorbed, the lung is again at liberty to expand with its usual freedom, limited only in proportion to the size of the clot which may happen to be in the pleural cavity.

3d. *Suppuration*, if not prevented, is greatly diminished by shutting out the constantly renewed currents of atmospheric air, and its character is very favorably modified.

Indeed, if the wound were closed soon enough, I deem it possible that the slough of the track through the lung, with the limited amount of attendant pus, might be entirely disposed of by absorption and expectoration. The operation which I practise is by hermetically sealing as follows:

All accessible foreign bodies having been removed, introduce the point of a sharp-pointed bistoury perpendicularly to the surface just beyond the contused portion, and with a sawing motion pare the entire circumference of the wound, converting it into a simple incised wound of an elliptical form; dissect away all the injured parts down to the ribs, then bring the edges of the wound together with silver sutures deeply inserted, at not more than a quarter of an inch apart; secure them by twisting the ends, which are then cut off short and turned down out of the way. Carefully dry the surface, and with a camel's hair pencil apply a free coating of collodion over the wound; let it dry, and repeat it at discretion.

For greater security shreds of charpie may now be arrayed crosswise over the wound after the manner of warp and woof—saturate it with collodion, and when dry repeat the process until the wound is securely cemented over: as a still greater protection a dossil of lint may then be placed over the part and retained with adhesive straps.

If there be a tendency to undue heat in the part it may be kept down with cold affusion; should any loosening of the dressing occur an additional coating of collodion may be applied. The sutures must not be removed until healing by *first intention* is complete.

Should suppuration occur so as to occasion distressing dyspnœa, proceed to treat it in all respects as a case of empyema, introducing the trocar at the most dependent point, and taking special care to avoid the admission of air.

My first experiment in hermetically sealing was in a bayonet wound of the abdomen in a private of the 18th U. S. Infantry, in 1861, which was followed by the best results. Since then I have deemed it the most eligible treatment for gunshot and penetrating wounds of closed cavities when not contra-indicated by serious complication. In incised or punctured wounds the paring process is of course dispensed with.

Practically the immediate results have been very remarkable, and I think unprecedented. The most painful cases of dyspnœa have been promptly relieved, the patient usually falling into a quiet slumber in about an hour after the operation, as in a case observed by my friends, Dr. Clements, U. S. A., Asst. Med. Director Army of the Potomac, and Dr. Taylor, U. S. V., Med. Inspector Army of the Potomac, and many others. The subsequent results, also, so far as I have been able to continue the treatment, have never disappointed my expectations.

I have obtained healing by first intention, and removed the

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sutures within five days after the operation. This mode of treatment by hermetically sealing has, I believe, never been practised before, though the principle of excluding the atmospheric air in gunshot wounds of the chest has been endeavored to be carried out by various expedients with relative advantages corresponding to the completeness of the occlusion effected.

Dr. Barnes, Med. Inspector-Gen. and Act. Surg-Gen. U. S. A., informs me he once treated a gunshot wound of the lung by stopping up the aperture with a conical tent made of a pouch of cloth filled with lint, its apex being fastened to a roller bandage. The dyspnœa was greatly diminished, healing by granulation took place, the case progressed unusually well, and terminated in recovery.

Neither in the Western nor Eastern Armies, however, have I seen any attempt at closing the wound; a covering of adhesive plaster or simple dressing is the only application I have seen used.

I think it will appear evident that the simple causes of fatality in gunshot wounds of the lung, and which have heretofore proceeded or abated uncontrolled by art, may each in their proper order be restrained and modified, if not prevented or removed by the simple operation above described, which in the worst event cannot possibly incur any risk of additional harm to the patient. Though the careful continuance of the treatment so necessary to proper success be certain to be interfered with in the successive transfers of the patients to the care of different medical officers, it should not prevent the performance of the operation at any time within forty-eight hours after the reception of the wound, as it may enable the patient to survive the shock and the transportation to the General Hospital, by which time a very dangerous period will have passed.

Some cases upon which I operated were six days in the ambulances, before reaching a General Hospital, part of the road travelled being of the worst description; on the fifth day all but one of these so treated were able to walk comfortably. On their arrival all the wounds were unfortunately reopened, except when the union was too complete to allow of it, and the usual water-dressing was substituted. Yet the ratio of mortality of the whole number wounded in the lung in that engagement, and which were treated indiscriminately, was nineteen per cent. less, dating from the time the wounds were received, than that of the cases previously admitted to that hospital, dating from the time of their entering the hospital. Though but five cases, their corroboration under the circumstances is valuable. When speaking of the whole number wounded, I omit one case in which I had not time to close the pos erior wound from which profuse hœmorrhage subsequently occurred, and in two days after which the patient died.

Camp on Rappahannock, Va., Sept. 14th, 1863.

On the Structure and Developement of the Vetebrate Skeleton.
By Professor HUXLEY, F. R. S.

In the course of the preceding ten lectures I have done my best to confine myself to matters of fact, and to the interpretation which directly arises from a very simple method as applied to those facts. The matters of fact have, as far as practicable, been demonstrated before you; at any rate, they are capable of demonstration. The interpretation has rested upon a principle so obvious that it requires no special justification—the principal that those parts in various skulls are identical, and should receive the same names, which correspond in development, and in their relations to the soft parts and to one another. And for myself I confess that with the establishment of those matters of fact, of those direct interpretations, the great object of science seems to me to be largely fulfilled. But in the present condition of anatomical views upon the skull, a course of lectures upon the vertebrate cranium which should be devoid of some commentary upon theories which have been offered of the composition of the cranium would, justly enough, be considered imperfect; because there is a true theory as apart from the speculative hypotheses—there is a true theory, which is simply a generalized statement of the facts which we have found out; and there are other theories, which add to such generalized statement other considerations, and which may or may not be capable of verification.

That which is commonly understood now by the theory of the skull, is the doctrine that the osseous cranium—it must be borne in mind that the doctrine has gone no further than the osseous cranium—is made up of a greater or smaller number of coalesced vertebræ, and that, to use the accepted phrase, the skull is a modification of the vertebral column. That doctrine originated with a man of vast genius—a man, perhaps, unexampled in the history of letters and of science, as combining, as I think, the highest proficiency in both departments—I mean Goethe. He originated, or rather I should say he invented, toward the end of the last century, the doctrine that the skull is composed of a number of segments, corresponding in their nature with the vertebræ. I am perfectly well aware that this has been controverted. I am well aware, that, not only in his own country, where there were personal interests and prejudices coming into play, but even in this country, where no such motives could intervene, the claims of Goethe to this discovery have been disputed; and not only that, but that it has been more than insinuated—and it is with regret that I state it—that the grand old poet, at seventy years of age, full of all the honors which his people had conferred upon him, was guilty of the meanness of taking to himself the credit of the doctrine invented by a young and rising professor, ignoring his claims and setting up others which had no foundation. Nay, more: the

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audacity of the accuser has gone so far as to suggest a certain stupidity, and that even Goethe—this man of vast imagination and undoubted ability—was constrained to invent the same method of accounting for his discovery as that which had been given by Oken. The statement has passed into English literature; it is to be found in a work which will be consulted by all who wish to be acquainted with this matter, and it will doubtless be regarded as an authority—it is to be found in an article upon Oken in the "Encyclopædia Brittannica."

What, then, are the facts of the case? Goethe, writing in the year 1820, or thereabouts, has stated that the mode of his discovery of the vertebral composition of the skull was this:—"The three hindermost parts," says he, "I knew before; but it was only in 1791, when I picked up an old and broken sheep's skull amidst the sandy dunes of the Jewish cemetery in Venice, that I perceived that the facial bones also were composed of vertebræ; and perceiving, as I did, the transition from the first pterygoid bone to the ethmoid bone and to the turbinals quite distinctly, there I had an *apercu* of the whole at once." We shall see that Oken, writing in 1807, also said, and no doubt with perfect truth, that he had been led to his conception of the theory of the vertebrate skull by picking up an old and whitened deer's skull, upon the Hercynian, within the Hartz mountains; and it has been more than suggested that this statement of Goethe's was a sort of clumsy fabrication imitating the invention of Oken. Happily, the general order of things in this world is tolerably just, and a document which Goethe doubtless had himself utterly forgotten (and which it is pretty clear, by a comparison of dates, he had forgotten) has appeared within the last year or two, which places the veracity of the old poet beyond the reach of the most vigorous and determined assailant. That passage was brought to light by an eminent German author a year or two ago, who says (referring to a correspondence which had just then been recently published between Goethe and the family of Herder, the clergyman and great literary German) Goethe was in the habit of corresponding with these people regularly; and he wrote, among other folks, to Madame Herder. One of his letters has come to light under the date of the 4th of May, 1790, and in that letter is this passage:—"By the oddest happy chance, my servant, by way of a joke, picked up a bit of an animal's skull in the jews' cemetery at Venice, and, by way of making fun, offered it to me as if he were presenting me with a Jew's skull. I have made a great step in the explanation of the formation of animals." It is quite clear that this is a complete and perfect testimony to the veracity of Goethe when, in consequence of various circumstances that took place, he affirmed that thirty years ago (it was exactly thirty years ago) he had made the discovery to which I here refer. It is to be hoped now that all further detraction, at any rate, will cease on that point. And this detraction was the more unwise because it was wholly unnecessary.

No person looking at the history of the past would dream of regarding Goethe, who indubitably invented this doctrine, but who kept it to himself for thirty years—led to that course doubtless by the great difficulties which his vast knowledge and clear judgment showed him were in the way of the application of the doctrine—I say, no one would have been led to set up his claim as a discoverer against that which is justly the right of Oken, who, in the year 1807, in a similar manner to that which happened to Goethe, was led, by picking up an animal's skull in the Hartz mountains, as I have said, suddenly to conceive that the osseous cranium was composed of three segments, and that the three segments answered exactly and precisely to so many vertebræ. No doubt Oken was the first promulgator of this doctrine; to him is all the credit that may attach to it justly due—all the credit that may attach to the definite discovery of the segmentation of the skull. Whatever we may think about his vertebral theory, no one can doubt at all that the merit of the discovery of the osseous segmentation of the skull is indubitably due to Oken; nor has anything been done since which in any way exceeds in merit that first singular paper which he published on the subject in 1807, under the head of "Ueber die Bedeutung der Schädelknochen." It was his inaugural address on taking the chair at the University of Jena; and to show you how easily this notion may have arisen, I have here that subject which led Goethe to imagine the vertebral theory, and that subject which Oken made use of as the best illustration of it—I mean a sheep's skull. The parts here have simply been macerated, and otherwise are left free in their natural connection; but you will see that it is perfectly easy, by exercising a little pressure, putting in the first place a knife between the supra-occipital, to separate one segment between the supra-occipital and the parietals, and, putting a knife again between the parietals and frontals, to separate another, and thus to obtain three perfectly distinct osseous segments. It was that which Oken saw in the bleached deer's skull; it was that which very naturally, and as I think very consistently, led him to say (he says the conviction came across him as a lightning flash) that this great skull, which contains the dilated continuation of the spinal marrow, is itself nothing more than a dilated continuation of the vertebral column. In his first essay he is guided entirely by the analogy of the sheep's cranium, and he says that the hindermost vertebræ, which he calls the ear vertebræ, is composed of the basilar portion of the occipital bones and the two ex-occipitals—the two articular portions and the supra-occipital; that the next segment is formed by the posterior sphenoid, by the great alæ of the sphenoid, and by the parietals; and that the anterior segment is formed by the pre-sphenoid, by the little orbito-sphenoids, and by the frontals. Use the term segments, leaving the doubtful term vertebræ out of place, and there cannot be a doubt that Oken was perfectly justified, and that the fact will remain as he stated it to be for all time, as one which you can always demonstrate in the

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osseous skull. Then he goes on to say that there is an anterior portion, consisting of the ethmoid, the nasals, and the vomer, and that you can take that away. He is somewhat doubtful as to what is the nature of this; but, at any rate, he suggests as a possibility that the vomer may be in reality the continuation forward of the vertebral axis, formed by the pre-sphenoid, the basi-sphenoid, and the basi-occipital; and that perhaps it may represent two or three vertebræ coalesced. He appears to be misled by some statement on this subject by an anatomical writer; but that point he leaves open. At first he stands simply by the three cranial vertebræ, as he calls them. He says: "You may think, perhaps, that I have forgotten the petrosal bone. Not at all. This petrosal bone is not a vertebræ; it contains no part of one of its vertebral components of the skull; but it is a sensory organ; it is an ossification developed around the organ of hearing which characterizes the formation of that organ, in just the same way as the membranous case around the eye is peculiar to that organ. Therefore you must regard this as something apart from the segments of the vertebræ, and look upon it as a sense capsule—not considering it as entering into the composition of the skull at all." Having arrived at this notion of the resemblance of the upper arches of the skull to the cavity of the upper arches of the vertebræ in the trunk, the next step was a very simple and very obvious one. Finding in the skull, so far, a perfect resemblance to the vertebral column, Oken, not unnaturally, arrived at the conclusion that the lower arches of the skull—the parts of the face—must answer in some way or other to the parts of the trunk; and carrying out that idea with the boldness which was characteristic of him—indeed, I might almost have said with the rashness which certainly characterizad the majority of his later speculations—he said: "If I find the repetition of this upper part of the vertebral column in the skull, I must also find a repetition of the lower part; and as I find there a thorax and abdomen, so I must find a thorax and abdomen in the skull;" and he said that the thorax of the skull was formed by the palatine bones and the adjoining parts, and that the abdomen of the skull was formed by the oral cavity. The idea is not so far-fetched as you might at first imagine. There is the same sort of *à priori* probability about it that there is about the identification of the upper arches of the skull with the upper arches of the vertebral column. By this time the notion of identity of composition as he progressed appears to have taken full possession of his mind, and he said to himself, "If we can find the upper and lower arches of the trunk in the head, we ought to be able to find the limbs." And totally undeterred by the difficulties which would have suggested themselves to a man of less daring in this matter—and those difficulties which, as I believe, kept Goethe from promulgating his doctrine—he said: "I will find all these parts. There is the shoulder-blade of the head in the squamosal bone; there is the arm of the head in the jugal

apparatus; and there is the hand of the head in the upper maxilla; and there are the fingers of the head in the teeth; and there is the thumb of the head in the pre-maxilla." If you had asked Oken how he knew that these were fingers and thumbs, and so forth, he would probably have been puzzled for an answer. He would have told you that the idea dominated over all these things, and that that great perception of an archetype, which was perceived only perhaps by the man of genius, could not be seen by inferior people who were simply looking at the facts; and he said, therefore, that the arm of the head was attached to the side of the head, fixed to it, and that the two hands of the head were, so to speak, expanded to the sides of the nasal capsule. Where, then, were the legs of the head? Nothing daunted, Oken said they were to be found in the lower jaw, and that the teeth of the lower jaw were the toes of the head in the same way, and that the hyoidean apparatus was nothing more nor less than the pelvis of the head. One would have thought that the difficulty of finding two legs of the head attached to scapulæ of the head here was rather a strong one; but Oken has an answer for all these matters. It is not worth while to enter into them largely now, having other things to attend to. It does not seem to have entered his mind that for anything like scientific speculation you must have a criterion of the truth or falsehood of what you say, and that unless you have some such criterion, you can go on inventing theories and counter-theories until Doomsday, every one of which shall be just as good as evey other. A few years afterward, Oken enlarged his idea by regarding the nasal apparatus as a fourth vertebræ, and thus arose that view of the skull as composed of four coalesced vertebræ, which has formed, without any considerable or material alteration, the basis of every speculation that has been published since. In this way Oken founded a school. His ideas were received with open arms in Germany, and his contemporaries, some of them, carried to a wonderful pitch the wildnesses—I had almost used a stronger word—with which the ingenious speculations of Oken are, to a vast extent, mixed. These, like Spix, for example, propounded the most extraordinary notions of the composition of the skull—notions which one must acquaint oneself with as a matter of history; but when one has done that, the best thing to do is to forget them, and to think of them no more. Others, more judicious, more accurate in thought, like Bojanus, enlarged the doctrine in other directions; but altered nothing, added nothing whatsoever to the method of Oken, but simply shifted backwards and forwards the lines of interpretation which he had suggested. By degrees the notion spread in France, or rather I should say that it had an independent origin there to a certain extent, partly depending upon an interchange of ideas with Germany, partly arising as the result of the development of notions which Geoffroy St. Hilaire propounded in France upon the unity of organization, and so forth. Thus further modifications were produced, some admitting three vertebræ, some making out

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that there were four, some that there were six, and some that there were seven; but the character of the reasoning and the method of the interpretation were not one whit changed from that which was invented by Oken.

In England, again we have had our own propounders of similar theories. I do not know that anything which I have said about Geoffroy St. Hilaire and about the Germans does not equally apply to them. I am quite at a loss to find in our English speculations any advance whatsoever upon the method, or in the main upon the facts, of Oken. If it is absurd, without good evidence, to talk of the jugal apparatus and the squamosal apparatus, and the upper jaw, as being the arm of the head, it is at least as absurd, without equally good evidence, and upon mere fantastical grounds, to regard the arm as a rib of the head. The one notion has exactly the same value and scientific standing as the other, and if transpositions of Oken shock the mind, not less do those who are accustomed to the study and careful interpretations which result from embryology feel astounded in having to believe that the appendage of the atlas has, somehow or other, got in front of the rib of the occipital bone, and thus given rise to the position of the parts as we find them. My business, however, is not to enter into a criticism of these theories, but simply to show what is their scientific position.

In France, however, and in England, there have been great exceptions to these mere blind developments of the notions of Oken. In France the enormous knowledge and accurate thought of Cuvier kept him from drifting into such conceptions. He admitted, as all must admit, that there was a segmentation of the skull; but the moment these notions of the vertebration of the skull were proposed, he said, "I want evidence; I want a criterion. It is of no use talking to me about the relative repetitions, shifting backwards and forwards, and all the rest. I want to know something which shall prove to me that these processes really do take place, or I will not accept your interpretation." Therefore Cuvier always held aloof from the vertebral doctrine, and I confess for myself I fully sympathize with those occasionally somewhat bitter sarcasms with which he overwhelmed the advocates of those notions, pernicious to everything like accuracy of thought, in his "Ossemens Fossiles," and his "Histoire Naturelle des Poissons." In this country, again, there has been another exception. I allude to Professor Goodsir, of Edinburgh, and the able young men who have risen from his training. He is the only man, so far as I know, either on the Continent or here, who has understood the value of that which took place between 1837 and 1840, or thereabouts, in Germany (of which I shall have to speak presently), and has endeavored to correct the errors of the merely Okenian line of speculation by the severe criteria of embryology. What was it, then, that took place between those years, 1837 to 1840, in Germany. It was a revolution in method—it was the discovery of that crite-

rion for the want of which this wild and waste method of speculation upon the nature of the skull had originated. At about the period to which we refer, Reichert and Rathke, two men whose names must always be mentioned with the profoundest respect in connection with the skull, commenced their embryological researches, and instead of confining themselves to the easy task of sitting upon their chairs, and speculating backwards and forwards as to how the bones of the skull should be fitted together, like a child's puzzle, they set to work to ascertain how they had really come, and by the most laborious and difficult studies of development, to see in what manner the complex adult skull had arisen from its early state, and how, by tracing back the methods of development, by tracing back every skull to that early condition in which it resembles every other skull, you are able to identify the precise places at which each bone arose, and so to eliminate from your mind the mystifying influences of subsequent change. These men—Reichert, by his discovery of the visceral arches, and by his wonderful study of their modification; Rathke, by his investigations in comparative embryology, and his still more remarkable discoveries, as I think, into the true nature of the base of the skull, and the mode of its production—founded an absolutely new epoch and a new method; and for me any work which has been published since that time, and which contains no reference to the labors of these men and ignores them, is on exactly the same scientific footing as a treatise on astronomy written at the present day which should ignore the discoveries of Newton; it is an anachronism, has no scientific place, and is unworthy of consideration.—*London Lancet.*

[From the Boston Medical and Surgical Journal.]

European Ophthalmic Institutions.

MESSRS. EDITORS: I had hoped to find time, while at Berlin, to complete to that point my description of the eye institutions of Germany, but find myself again in arrears.

The school of Vienna has long been regarded as one of the most famous in the department of ophthalmology, a series of distinguished professors having occupied its chairs. Most of those who were there at my former visit had passed from the stage, but their places are most worthily supplied by their successors.

No city offers easier and more concentrated facilities than Vienna, for study in this, as also in other departments of medicine. Two of the principal cliniques, those of Profs. Arlt and Jäger, are comprised within the walls of the great general hospital—a city rather than a house, of the sick. Another equally interesting clinique is established at the neighboring large military hospital under the care of Professor Stellwag von Carion. All of these

gentlemen are well known by their published works; Professor von Jäger by an illustrated atlas of morbid appearances of the internal parts of the eye, as disclosed by the ophthalmoscope, and Professors Arlt and Stellwag von Carion by treatises on the pathology of the eye, both of great excellence, and of which the late edition of the latter's work is regarded as one of the best expositions of the present state of science as regards the diseases described.

As the hours are not the same at the different cliniques, the student has an opportunity of first following the visit in the wards and seeing those who come for consultation as out-patients with Professor von Jäger or Stellwag, and also of witnessing their operations, and is afterwards in time to follow the same course in the wards of Professor Arlt. After his operations have been performed, Professor Arlt adjourns to the amphitheatre to receive the out-patients, and takes great pains to exhibit and explain the cases of interest or those serving as types of different maladies. The manifest interest exhibited by the Professor in the improvement of his pupils must be encouraging to them. After the consultation is finished, comes a lecture of more or less length, at the conclusion of which he gives a private course of operations to a class of young doctors of medicine. He had the kindness to invite me to be present at this course, and to do, himself, for my gratification, such operations as he did not find opportunities of performing upon patients in the wards.

This private course, as also that by Prof. von Jäger on the ophthalmoscope, are so highly valued as to attract pupils from all parts of Europe. Each member of the class has opportunities for repeating over and over again, under the direction of the Professor, all the capital as well as the lesser operations on the eye and its appendages.

Among the out-patients are to be seen a very large number of Polish Jews, who exhibit the extreme of filthiness of person, and who live, as I learned, in close hovels, under very unfavorable hygenic conditions. Most of the affections for which they come for advice are cases of conjunctivitis, aggravated by neglect to an extreme degree. In the military hospital a large proportion of cases of purulent and catarrhal affections of the conjunctiva is also observed, as might be expected of this age and class of patients.

The general hospital of Prague occupies one of the best possible positions, on very high ground, where there is a free circulation of air, and commanding fine views of the picturesque city on the one hand and its charming environs on the other. It has a splendid ophthalmic department, under the care of Prof. Hasner. He is an exceedingly rapid and a very skillful operator, and evidently takes great pains in the clinical instruction of the pupils. Though the number of patients is less than at Vienna, it is still ample for all purposes of observation, and a student has certain advantages in an institution of this character which he loses in

those of larger cities. He has opportunities for deliberate examination of patients and for obtaining explanations in regard to them, which are impossible where he is one of a crowd of learners; and, for a beginner, I think such a school as that of Prague is to be preferred, as affording even better instruction than he can gain at Vienna or Berlin. He has also opportunities for observing the after-treatment of cases operated on, which are not always afforded in large cliniques where the rapid succession of events prevents too close surveillance of those which have preceded.

As the ancient capital of Bohemia, and being at a distance from the imperial city, Prague forms a centre which attracts to itself a large number of cases requiring operations, for the good results of which both the high reputation of Prof. Hasner, and the extremely favorable situation of the hospital, concur.

Prague is one of the most interesting cities of Germany; remarkable for the picturesque effect of its numerous quaint towers and fortifications, the stateliness of its grand old edifices, and the beauty of its environs, and a residence there might pass very agreeably. Truly yours, H. W. W.

Utrecht, Holland, 20th July, 1863.

Efficacy of Sesquichloride of Iron for the Treatment of Ulcers about the Nails.

M. Billon communicates the following to the *Journal de Med. et de Chirurgie*:—Dr. Gaillet, of Luynes, (Indre et Loire,) having recently published a case in which the application of sesquichloride of iron effected a cure of the affection popularly termed *the growth of the nail into the flesh*, I take this opportunity of recording several instances of the same kind, witnessed by myself, which confirm the results obtained by M. Caillet, and may, perhaps, be deemed not wholly uninteresting. In 1858, Dr. Wahu, staff-physician to the army, having succeeded with this remedy in curing the painful diseases in question, I resorted to the same method, and with the greatest benefit in four cases. I may here remark, that ulcers about the nails are occasionally observed among our soldiers, having escaped the attention of the medical boards, or being caused by the pressure of the boot during forced marches. Under these circumstances, a *prompt* and *painless* cure may be effected by inserting the *dry* sesquichloride between the nail and the protruding flesh, and powdering the latter with the same substance. A large bandage should be applied over all, not impregnated with the *liquid* sesquichloride of iron, as recommended by Dr. Caillet, a precaution which may, however, be useful, as the folds of the band dry rapidly, and preserve their situation in a more exact manner.

On the following day, the exuberant flesh is found to have acquired the hardness of wood; suppuration speedily ceases, and a cure follows after two or three applications. This simple and mild treatment is obviously far preferable to the numerous surgical procedures hitherto recommended. In the course of four or five days, in a week at the farthest, the original pain ceases, the swelling subsides, and the patient is able to walk. Naught remains but the hardened protruding flesh, which falls away about a month after the application of the sesquichloride of iron. These are the results yielded by the method in four soldiers suffering from the growth of the nail into the flesh. They have appeared to be sufficiently remarkable to warrant the communication.

Bibliographical Notices and Reviews.

On Diseases of the Skin. By ERASMUS WILSON, F. R. S. Fifth American from the Fifth and Revised London Edition, with Plates and Illustrations on wood. Philadelphia: Blanchard & Lea, 1863. (For sale at the city book stores.)

This work, so favorably known to the profession, has reached its fifth edition. This edition contains the Plates illustrating diseases of the skin. The publishers of the American edition have added also the plates prepared by the author to illustrate his work on *Constitutional Syphilis* and *Syphilitic Eruptions*. These improvements render this edition very valuable.

The plates are very well executed—the coloring being as perfect as is usually observed in works of this kind.

If it were necessary we might commend this work to the attention of those just entering the profession as a good résume of what is known of the skin—its physiology, pathology, the treatment of its diseases, etc.

To the student of medicine a knowledge of the functions of the skin is very important, because upon this will very much depend success in treatment.

Those who undertake to study the functions of the skin should bear in mind its glandular character and its nervous and vascular endowments. In one sense the skin is a great gland enveloping

the body and separating from the mass of the circulation water, fatty matters, phosphate of lime, carbonate lime, carbonate magnesia, chloride sodium, acetate soda, chloride potassium, acetic acid; sulphates, acetates, lactates and certain other substances which even the chemist is unable to appreciate, but which the alfactories often take cognizance of. The entire length of the glandular tubing, for the elimination of the perspiratory fluid, is about 153,000 inches, or two and a half miles. The office of the cutaneous perspiration is, it is said, to regulate the temperature of the body. This is only one of its offices, though a very important one.

The Sebaceous system has for its object the secretion of oily substances, mixed with mineral matter of several kinds. The office of these oily substances is, as yet, a matter of speculation. Besides these glandular movements the skin, from some very conclusive experiments, must be regarded as taking a part in the process of respiration. It has been found by inclosing one of the limbs in an air tight case, that the air in which it is confined loses in oxygen and gains in carbonic acid. A very striking endowment of the skin is its capacity to resist extremes of temperature. The blood has a temperature of 98 or 100 degrees, and, strange as it may appear, this cannot be changed. A change of a few degrees in either direction is fatal to life. The endowments of the skin, however, are of such a character that the body is protected in a temperature that freezes mercury, or one of twice the elevation necessary to boil water. The skin has the powers of one of the special senses. Indeed, it not only performs the office of tactility, but is capable of taking the place, to a very considerable extent, of the eye or ear, when either is impaired. Other offices may be noticed, as for example that of exosmosis when the body contains an excess of water, and endosmosis when there is a deficiency.

Such is a very partial summary of the offices of the skin—its physiology. The diseases, of course, relate in some way or other to these functions. They may, as Andral would say, involve simply "alterations" of function or "alterations" of structure. In either event the student's knowledge will depend very much upon his knowledge of the physiology.

From such views it would seem that cutaneous diseases might be most profitably classified on the *Anatomy* and *Physiology* of the skin. This really was the classification of the first edition of this work. In that we had—1, Diseases of the Derma proper;

2, the Sodoriparous system; 3, Sebiparous system; 4, Hair and hair follicles. However well adapted this *Physiological classification* might be for the student or scientific inquirer, it was thought by the author to be not equally suitable to the practitioner. In its place, when the *fourth* edition of the work was being issued, the author adapted the *Etiological classification*, a classification founded on the supposed CAUSE of cutaneous diseases. This classification was proposed by Hippocrates when he divided cutaneous diseases into *local* and *constitutional*. *Local* he believed to depend upon some pathological change present in the part, and *constitutional* affections he regarded as an effort upon the part of nature to throw out or eliminate a cause of disease by the cutaneous system. The works of Lorrey and Baume's are founded on a similar classification. Galen made a classification of cutaneous diseases, known as the *Topographical* classification. He, as a consequence, divided cutaneous diseases into such as affect the head and such as affect the remainder of the body. Alibert, a modern writer, adopts the classification of Galen. Plenck in 1776, grouped all diseases of the skin into fourteen classes, namely: Maculæ, Pustulæ, Vesiculæ, Bullæ, Papulæ, Crustæ, Squamæ, Callositates, Excrescentiæ, Ulcera, Vulnera, Insecta, Morbi unguium, and Morbi pilosum. These classes he subdivided into one hundred and fifteen genera. Willan pruned this classification down and adopted it in his work of 1778. His orders of cutaneous diseases, eight in number, are as follows: Papulæ, Bullæ, Squamæ, Exanthemata, Vesiculæ, Pustulæ, Tuberculæ, Maculæ. We will now hear the author, for a moment, on his Etiological classification:

"The great family of diseases of the skin admits of division into two primary groups, namely:

1. Diseases affecting the General Structure; and
2. Diseases affecting the Special Structure of the skin.

"The diseases affecting the general structure of the skin, or derma proper, are such as implicate at once all of the tissues which enter into its composition.

"The diseases affecting the special structure of the skin are those which select its separate components, such as the vessels, nerves, papillæ and pigment; or its special organs, namely, the sodoriparous glands, sebiparous glands, hair follicles and hairs, and nail follicles and nails.

"The diseases affecting the general structure of the skin are divisible into five groups, namely:

"I. Diseases affecting the General Structure.

1. Diseases arising from general causes.

2. Diseases arising from special external causes.
3. Diseases arising from special internal causes.
4. Diseases arising from the syphilitic poison.
5. Diseases from animal poison of unknown origin, and giving rise to eruptive fevers.

"The diseases affecting the special structure of the skin are divisible into eight groups, namely:

"II. Diseases affecting the Special Structure.
1. Diseases of the vascular structure.
2. Diseases of nervous structure.
3. Diseases of papillary structure.
4. Diseases of pigmentary structure.
5. Diseases of sodoriparous organs.
6. Diseases of sebiparous organs.
7. Diseases of hair follicles and hair.
8. Diseases of nail follicles and nails."

We have no space for a more detailed notice of the nomenclature of cutanous diseases. We may say, however, that our author is philosophical, as much so as can be expected in the present state of our knowledge, in his selection of terms for varieties and subvarieties.

The medication of the skin is a subject that addresses itself to both physician and surgeon. The treatment divides itself naturally into *constitutional* and *local*. The constitutional treatment is generally more efficient when combined with the local; and, on the other hand, the local is often useless without remedies that impress to a greater or less extent the general system.

Cutaneous diseases rarely call for blood-letting, either by the lancet or leeches. In cases, however, characterized by high fever and much heat of surface, the loss of blood will prove beneficial. Saline purgatives, diaphoratics, diuretics, the compound extract of colocynth, blue pill, the liquor ammonia acetates, are the remedies that are most available. Syphilitic eruptions are moved very imperfectly with any thing indeed, until the poison is neutralized or eliminated from the system. The same remark is applicable to eruptions connected with other constitutional affections.

There is a very large number of cutaneous diseases that require nothing except local remedies. This class is larger too than might be supposed. The trouble in such is not in the blood; nor does it consist in deranged secretions. It is in the cutaneous tissues alone.

We close here our notice of this volume; and in doing so we may say that its perusal impressed us with the belief that the author has given an impetus to the study of the skin diseases. Much, however, remains to be learned. We have a great many affections for which we have no remedy whatever—too many! too many! Nevertheless if others labor with the industry of our author, the number of these may be abridged.

Obstetrics—the Science and the Art. By CHARLES D. MEIGS, M.D., lately Professor of Midwifery and the Diseases of Women and Children in Jefferson Medical College, Philadelphia; and one of the Physicians to the lying-in department of the Pennsylvania Hospital; member of the Society of Swedish Physicians, Stockholm; Corresponding member of the Hunterian Society, London, etc., etc., etc. Fourth Edition Revised, with one hundred and twenty-nine illustrations. Philadelphia: Blanchard & Lea, 1863.

In this edition (the fourth) the author states that he has endeavored to amend the work by changes in its form, by careful correction of many expressions, and by a few omissions and some additions as to the text.

It will be noticed that the article on Placenta Prævia has been re-written in this edition. The author was led to this for the purpose of noticing certain new modes of treatment which he regarded as ill-founded so far as the philosophy of obstetrical science is concerned.

The form of the work has been changed by dividing it into paragraphs or sections, numbered from 1 to 959. In this arrangement the author has had in view the convenience and welfare of the student.

Very few teachers have succeeded so well as Professor Meigs. He has always made his department in Jefferson Medical College very interesting. His didactic efforts have, for years, been spoken of as very superior. He knows how to arrange his matter so as to secure completely the attention of the student. His books have been severely criticised because written in a very familiar, and to many whimsical, kind of style. Still he teaches his subject, teaches it thoroughly and makes the labor of acquiring easy and agreeably to the student.

The volume before us embraces a very thorough review of obstetrics. The author's knowledge of the labor of others is very full. But, perhaps, the chief value of the work is that it contains what the author has, himself, seen during a long life of usefulness in a wide field.

Professor Meigs has now retired from teaching, having resigned his chair some two years since. This edition of his work is dated at Hamanassett, Delaware co., Pa., a place in the vicinity of Philadelphia, where he expects to spend, in quiet, the remnant of his days.

Editorial and Miscellaneous.

Qualifications of the Soldier.—The War Department, it seems, has furnished to Examining Surgeons a catalogue of diseases the presence of any one of which exempts from military duty.

From the appearance of the catalogue it would seem to have been gotten up by an amateur, or some one, to say the least, having but little practical knowledge of disease.

The government wants sound men, men capable of undergoing the fatigues and privations of the soldier. In order to get such, the questions should not relate so much to the presence or absence of local affections, as to the general state of the body. What, for example, it might be inquired, is the condition of the bones? They should be large and well matured. What of the muscles? Have the habits been such as to harden the muscles? What is the state of the lungs? Endurance is impossible without strong lungs.

In trying to bring about the objects of the government, much more will depend upon the capabilities of the Surgeon than upon an arbitrary list of diseases he may be furnished with. The human body is so constituted that it requires a man of ability to look upon it and understand the nature and quality of the matter of which it is composed, and the movements of this matter.

Possessed of good physical powers, an individual, although laboring under some local disease, will be found to be more able for

the hardships of a campaign than one with a poor constitution and free from all kinds of disease.

Starling Medical College.—The present session of this institution opens with a very fine prospect for a good class. The facilities now here, it may be remarked, for teaching are very clever. Students have access to the Penitentiary Hospital, County Infirmary Hospital, and to the Military Hospital on Broad street. Dissecting material is also abundant.

Vaccine Virus.—We see it stated in the Cincinnati Lancet and Observer that Mr. Schmidt, 633 Main street, Cincinnati, keeps constantly on hand a supply of vaccine matter, put up in hermetically sealed glass tubes. Price, $1.00.

Nashville University.—The Medical Department of Nashville University is about to resume teaching which has been suspended for the last two years. This school, before the present troubles of the country, rivaled, in the number of its students, the largest schools of the country. During one term its students numbered over four hundred.

Surgeons in the Libey Prison.—The following is a list of Union Surgeons confined in Libey Prison:

W. V. Houston, 122d Ohio, captured June 15th; W. F. McCurdy, 87th Pennsylvania, June 15th; Allston W. Whitney, 13th Mass., June 20th; W. A. Rodgers, 3d Tennessee, June 19th; Wm. Spencer, 73d Indiana, April 30th; J. L. Morgan, 10th Mass., May 13th; C. E. Goldsborough, 5th Maryland, June 15th; H. L. Pierce, 5th Maryland, June 15th; Lewis Applegate, 102d New York, July 2d; T. C. Smith, 116th Ohio, June 15th; A. A. Mann, 1st Rhode Island Cavalry, June 18th; R. P. McCandless, Ohio, June 15th; A. S. Looker, 5th Illinois Cavalry, May 20th; C. T. Simpers, 6th Indiana, June 15th; F. M. Patten, 12th Virginia, June 15th; O. Nellis, 2d Virginia Cavalry, July 19th; W. B.

Myers, United States steamship Georgia, May 14th; W. F. Bowler, 12th Pennsylvania Cavalry, June 15th; J. L. Brown, 116th Pennsylvania, June 15th; —— Ketchum, 83d New York, June 20th; D. B. Wren, 75th Ohio, June 20th.

Ex-Surgeon General Hammond is, we notice, traveling as a kind of Medical Inspector. He has been south as far as New Orleans, and is now about making a tour to the Cumberland. These movements of the Ex-Surgeon General may be very valuable to the service; but we can hardly imagine a visitor less acceptable to the medical men of the army. The Calomel and Tartar-Emetic edict is not yet forgotten, nor will it be very soon. The idea that of any one man should dictate to all of the Surgeons of the army what they were to use in the cure of disease! The Ex-Surgeon General is pretty clever. No one can read his book on Hygeine and deny this. Still he has a soft place on his pate or he never would have issued "Circular No. 6."

Syphilis.—The poison producing this disease, Dr. Samuel W. Francis proposes calling *syphiline.* This is all well enough; but we would like rather better to hear of something to prevent the prevalence of the disease, for it is very much on the increase now. A disease so destructive in its effects certainly ought to receive a large amount of attention. For the more malignant form of the disease there is no earthly cure. The subject of it may make up his mind to have it hanging to his skirts as long as he lives. The disease, however, may, to a considerable extent, be prevented; and it is here that labor may be bestowed to best advantage.

We have no statistics of the prevalence of the disease in our country; but something may be suggested by the following:

"*Syphilis in the English Army.*—From the Army Statistical Reports it appears that the annual admissions into hospital from venereal diseases amount to 206 in every 1000 Cavalry soldiers, 250 in the same number of Foot Guards, and 277 in every 1000 Infantry of the Line. The average proportion for the Army at home is 267 per 1000, or more than one-fourth of the whole number. It is calculated that on the lowest average each man is

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fifteen days under treatment. Thus 688 men out of the home force are always in hospital from this cause alone—a number equal, or nearly so, to the strength of a regiment on the home establishment; and the money loss to the State is calculated at nearly £14,500 a year. The further loss from subsequent disease and invaliding, and the injury to the State from the life-long deterioration of the individual and from the hereditary curses of transformed syphilis and scrofula conveyed to future generations, are beyond calculation. In India the case appears worse than in England. The proportion of venreal cases constantly in hospital is usually from 20 to 25 per cent. of the total sick. At some of the larger stations it much exceeds this. At Bangalore and Roorkee the proportion at the time the report was made was 50 per cent.; at Dinapore it was as high as 53 per cent.; and Dr. Maclean testified that a few years ago in the 1st Madras Fusiliers the amount of syphilis was equivalent to the withdrawal from duty of one-fourth of a company daily."—*Lancet.*

Correspondents.—The public mind at the present is so occupied with the military enterprises of the country, that everything except practical matters, seems to be in a great measure neglected. We hope, however, soon to hear again from our old correspondents. Some of them, we know, are in the army, and have but little time to write; such should be "taking notes" which will be valuable hereafter.

Small-pox.—This disease which has been epidemic in our city during the past summer has almost entirely disappeared. We treated quite a number of cases both in private practise and at the Pest-house near the city. We preserved notes of our cases and shall make a digest of them as soon as we can find the time.

The Number of Patients in the U. S. General Hopitals at the present time is said to be 41,195.

Death of Dr. Geo. Hayward of Massachusetts.—This event took place on the 7th ult., at the advanced age of 72.

Close of the Fifteenth Volume of the Journal.—This No. completes the 15th volume of the JOURNAL. Those who are in arrears should embrace the present auspicious time to close up their accounts.

All letters on business may hereafter be addressed to Dr. JNO. DAWSON.

On the Formation of Mucus and Pus. By THOMAS K. CHAMBERS, M. D., Hon. Physician to H. R. H. the Prince of Wales, Physician to St. Mary's and the Lock Hospitals, &c.

In the vitalized forms which they present, we may consider pus and mucus as identical; the pus-globule being merely the descendant, more or less remote, of the mucus-globule, and both retaining only that low degree of life which they originally derived from the body. The physical differences between the two depend seemingly upon the medium in which these vitalized forms are suspended. Neither in pus nor mucus are the contents of this medium constant in their proportion to one another: no two analyses of pus or mucus are ever the same.

Indubitable pus and indubitable mucus may be clearly defined as the two ends of a scale, between which there are innumerable gradations. The most transparent, stringiest, and least globular mucus consists principally of a peculiar animal matter, which is not albumen, though it closely resembles it. It is not coagulable by heat, and it contains more oxygen on ultimate analysis than albumen does. Sulphur also appears not to be one of its constituents. Until it can be found reducible to be considered a compound of some known intermediate substances, it is temporarily called "mucin." This word simply means mucus divested of those contents which are capable of another nomenclature and physical separation—as, for instance, epithelium-scales, blood, the ammonia of decomposition, &c. The analyses are well known, being reprinted in every work of physiological chemistry, but shed little light, for the obvious reason that the substance analyzed is hardly ever twice the same.

Pus, on the other hand, contains a large quantity of albumen and a large quantity of fat. A modification in the mode of the loss of health is characterized by the presence of fibrin, and certain

forms of defective vitality by casein being found. The inorganic constituents of both seem to be the same as those of blood-serum with some of its water lost. Our diagnosis, then, of the morbid secretions of the mucous membranes should not be absolute—not that such and such a specimen *is* pus or *is* mucus—but comparative, that it is *more or less* purulent, according as it exhibits a greater or smaller quantity of albumen; a fact easily ascertained by the degrees of its coagulation by heat when diluted with water. And this is thoroughly practical and important, for it indicates the degree of loss of local vitality in the secreting membrane. Equally practical, also, and important is the observation of the presence of fibrin and its amount. In large and overwhelming quantities we are familiar with it as occurring in the most serious deficiency of life consistent with life at all which we find in mucous membranes; and there appears even in minor cases a close connection between its amount and the degree of deficient vitality or inflammation. During a severe cold in the head minute clots of spontaneously coagulating fibrin may be found in the secretion of the Schneiderian membrane, which, existing in large quantities, form the false membrane indicative of the serious poisoning of the system in diphtheria and croup.

The phenomena we see on the mucous membranes are a question of degree rather than essential difference.

Loss of vitality, as shown in mucous membranes, seems to be exhibited in the following degrees.

First, there is an *arrest of function*. For example, from the impression of cold the Scheiderian membrane is temporarily deprived of its endosmotic force; it ceases to absorb the water which is condensed on its surface from the breath, and that water drips from the nostrils. Or the stomach or intestines, from mental or physical causes, are deprived of their power of absorbing and digesting the fluid matters presented to them, and partially first excreted from them; and these fluids may pass away by diarrhœa. Or the skin is chilled, and shows its deficient vitality chiefly in the deficiency of its most prominent function; though it feels painfully, it cannot feel so delicately as it ought. In a vigorous person full life is soon regained; the nose recovers its natural degree of dryness; the intestines absorb again before the fluids have passed from the body, and the temporary indigestion does not arrive at diarrhœa; the skin recovers its feeling after a temporary painfulness. But

we know that our invalid patients, whose vitality is low, are not so easily reinstated. Catarrh of various parts quickly and readily follows the action of physical agents. It is probable that in this least degree of injury the capillaries are contracted in area, and consequently the rapidity of their stream increased, by the action of the nerves. This phenomenon is wanting if the injury is greater; in experiments upon animals the microscope does not detect it, if the reagent applied is powerful.

2. A greater degree of injury is accompanied by a loss of elasticity in the capillaries. Their dilatation, and the consequent retention and stagnation of the blood in them, is familiar to us all, in both the living and the dead subject, as "*inflammatory congestion.*"

3. This stagnation may be in isolated spots complete; the blood-discs adhere together in rolls, as when removed from the body, and block up the passage. Thus the arterial wave is obstructed in its course, and like an ocean-swell shattered against a shore of rocks becomes more evident to the senses as the well-known "*throbbing.*" It is shortened and sharpened, but there is no evidence that it is strengthened; indeed, the analogy I have cited, and the general fact of weakness being accompanied by quickened pulse, would seem to show that it is diminished in propelling force.

In the mean time there is an accumulation of that constituent of the blood which most resembles in appearance the element of young growing tissue—the colorless blood-corpuscles. The blood is dark, indeed, to the naked eye, but under the microscope is seen to be made dark by being filled with these pale bodies, possessing a high refractive power.

The loss of elasticity in the coats of the capillaries renders them more easily permeable by the contained fluid. Serum is poured out into the neighboring parenchyma, and joins with the swollen capillaries in producing "*swelling.*" The loss of vitality in the blood-discs may be so complete that their hæmatin is disolved in the serum, and we get the surrounding parts stained with it—as for a short time in typhus fever, and for a long time in syphilitic eruptions. Or the bloodvessels may completely lose their cohesion and be ruptured, allowing of hæmorrhage. But in all this there is no new process, nothing which is not a direct deficiency of function.

In solid structures this effusion is followed by an endosmotic current of the watery part back again into the circulation, leaving behind it the more solid and coagulable constituents. On free surfaces,

covered only by soft open epithelium, the water and salts therein dissolved escape, forming the fluid of the mucus. The elements of new tissue, being there very copious to supply the constant demand for growth, ooze out copiously with the serum, and constitute the mucous globules. They are wasted elements of new growth, not themselves a new creation, or evidences of superadded life.

How do these matters get through the coats of the capillaries? There cannot be holes for their escape, or the blood-discs, which are the smaller of the two, would always escape also. Doubtless this is one of the great riddles of physiology. But I think the art of drawing is in a certain degree responsible for some of the difficulty which it presents to our minds. When we have no means of correcting by our other senses impressions made on the eye, we are too apt to consider everything with an outline as equally solid. The necessarily hard outlines of the engraver express to us forms which may, for all we know, be spheres of cast iron, whereas in truth they are as delicate as aërial clouds. Why may they not pass through tissues, mutually dissolving and dissolved by the materials of those tissues? Just as we see a stratum of fleecy cloud among mountains, or in Turner's pictures, dissappear when it comes to a stratum of warm air, and reappear in the same form when it emerges on the other side. To get just ideas of nature, we must look upon solidity as a comparative, not as an absolute quality.

4. In a higher degree of deficient vitality the serum contains albumen and fat also exuded with it; and this mixed with the multiplied globules constitute the fluid we call "pus." The albumen and fat not only escape on free surfaces, but saturate also the tissues they escape through, making them more retentive of water than would otherwise be the case. Inflamed cuticle takes a much longer time to dry than normal cuticle. Langhans found that a piece of healthy rabbit-skin was dry in three hours, but a piece of the same which had been inflamed during life took twenty hours to part with its moisture to the same extent. Thus it appears to be saturated with the nutriment which it has lost the power of employing aright.

5. Pus formed as I have described is a soft, greasy liniment, which tends probably to shield the parts with which it lies in contact from foreign influences, which in their condition of lowered vitality would be noxious to them. It is more bland and less liable to decomposition than any artificial application. Kept on the

healthy skin it causes less irritation than even water. But under certain circumstances it becomes what we term *ichorous*. In this state it is corrosive, poisonous, and destructive to the neighboring tissues. Now, this cannot arise simply by the chemical decomposition of the pus itself in consequence of retention, because in a good many cases (as in cancrum oris, for example) it has not been retained so long as usual, but is thrown off ichorous and irritating as it is formed. But you may observe that in all these instances of ichorous pus there is necrosis, mortification, ulceration, or some other form of actual loss of tissue. Tissue may be forming as in granulations, but it is being destroyed at the same time with abnormal rapidity. I cannot but think, therefore, that the ichorous nature of such pus may be due to its saturation with the organic acids which are the results of the decomposition, not of the pus itself, but of the melting tissues. Wash away this irritating pus, clean the sore, and that which is then formed often is quite bland and benignant. As pus differs from mucus, so ichor differs from pus in the nature of its accidental fluid constituents.

The formation of ichorous pus exhibits a further stage of loss of vitality. The poisonous part of it seems to be peculiarly soluble, and capable of uniting with, and destroying, animal tissues. Absorbed into the blood, it naturally destroys the vitality of the constituents of that fluid, causes it to coagulate in localized spots, and thus to give rise to the congestions and abscesses of pyæmia. When we reflect how easily ulcerations may arise in mucous membranes, and what an active surface they offer for absorption, we cannot be surprised at the frequency with which pyæmic abcesses follow slight injuries, such as operations on the bladder, crushing of calculi, typhus inflammation of the bowels—cases which seem of minor moment, but which certainly involve solutions of continuity, with consequent decomposition of tissue and the formation of ichor, in a situation very open to absorption.

6. The formation of fibrinous coats on mucous membranes I have already shown not necessarily to involve destruction of the epithelium. Is the loss of vitality which causes it to exosmose through the capillaries in the fibrin itself or in the walls of those vessels? Whichever it may be, such an exudation certainly is evidence of a great deficiency of life; and, moreover, by the mechanical impediment it throws in the way of the functions, usually leads to further deficiency.—*Lancet.*

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[From American Medical Times.]

Wounds of the Cavities, Viscera, and Brain.

[Third letter of Dr. A. H. Hoff, Surgeon U. S. V., to Prof. March of Brooklyn, N. Y.]

Dear Sir: I have expressed to you very freely my ideas in reference to resections, support of fractures, etc., etc., and I shall devote this letter to wounds of the cavities, viscera, and brain. Wounds of the chest are not as common as one would suppose. It is a singular fact, that a vast majority of wounds are of the extremities. However, it has been my fortune to have had placed in my charge quite a number wounded in the chest, and most of these several days after receiving the injury. The history of these cases, so far, does not endorse the determined necessity of the peculiar treatment presented heretofore by many of our military surgeons. I find here, as well as everywhere, that we all are inclined to ride our hobby, some insisting upon one thing, and some upon another. But what has surprised me most, is the fact that in the midst of a multitude of opinions our patients recover with but little of our interference. I have not seen, so far, a single case of internal hæmorrhage from a gunshot wound penetrating any of the cavities, supposing the reason to be that death invariably ensues within a short time after the wound is received. Those cases that have come under my notice, have, so far, simply required care as to *position*, and a moderate degree of treatment, having a tendency to compose th · nervous system, and hold in check inflammatory action.

Hearing the air rushing out through an aperture in a man's back, and through another in front on the opposite side, at every expiration, would incline one to make a very unfavorable prognosis; but to have the same man shake you by the hand six months after, with his musket slung across his shoulder, well and hearty, would lead you to ask how can this be, and what has been done to accomplish it. On inquiry, you find that first one hole closed up; then, after a little, it produced no inconvenience to stop up the other. The expectoration, which was somewhat troublesome and streaked with blood, continued for two or three days; then more oppression was felt, some twinging pains, respiration after reaching a certain point was painful, but the patient could get along

without breathing so long; it did not seem necessary to support life that a full inspiration must be taken, and it could not be done because it hurt; felt better in a semi-recumbent position, but found lying on the side, "scoop fashion," did just as well, and enabled him to sleep and let all the matter run out; had a first-rate appetite, but had to be careful not to fill his belly too full, as he could not breathe so well; washing him off with cold water now and then, first along with a patch spread on his breast, kept cool, felt first-rate, made him breathe easier, and then, keeping perfectly quiet, not talking any, and having folks keep away from him, saved his life. "Did'nt take much doctor stuff; a little stuff now and then to make him sleep, and once, he believed, a little physic to open him." I have outlined this conversation for the purpose of pleasantly demonstrating what made a man so severely wounded feel comfortable, gleaning from it the following indications: 1st, Keep the orifice open. 2d, Be particular as to position, consulting the patient's feelings carefully, as he is the best judge. 3d, Keep the chest cool. 4th, Give free exit to all discharge. 5th, Quiet all irritation by keeping the patient perfectly quiet, giving anodynes, but with great care; be cautious about diet, more especially quantity, and meet with decision any untoward complication your watchfulness may discover. Don't think, because the wound is dreadful, the remedies must be dreadful with which you attack it.

On looking over what I have written, I feel inclined to think you will laugh at me, but you know my hobby is to add the sufferer's opinion to my own thinking, thereby better to get at the indications; for he feels the pain, and I judge of the cause; he knows when it is releived, I find out the reason. Nature cures, I do the best to assist. Allow me here to make this remark; on the battle-field it would be a troublesome matter to carry out the immediate treatment recommended for gunshot wounds of the chest accompanied with severe hæmorrhage. I hope it will never be my fortune to receive one, as death would be my certain doom.

I find I have consumed all my time. The army is in front of Vicksburg; what is to be done, I have not been informed; but I am happy to say that the medical department out here is in first-rate condition; everything in readiness, let come what will.

U. S. Hospital Steamer D. A. January,
Young's Point, La., March 29, 1863.

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Ice in the Treatment of Diphtheria.—The *Revue Thérapeutique* contains a paper by Dr. A. De Grand of Bologne, late French Vice Consul at Havanna, in which he mentions ice as an infallible remedy for diphtheria. As this, from its extreme simplicity, would, if so effective, be far superior to any yet tried, I cannot refrain from quoting the cases mentioned by the author, who first brought it into notice in February, 1860; and consequently complains, not without reason, of the inexcusable negligence of many practitioners in not adopting it, and thereby saving the valuable lives now annually lost by this disease. The following cases came under his observation after that date:

In March and April, 1861, diphtheria broke out in an epidemic form, chiefly attacking adults, and was of such virulence that in one week three young women died in a single house. On of Dr. De Grand's patients was seized with it, and as he could not immediately attend, and the case being a severe one, another physician was called in, who ordered emetics and aluminous gargles, which were of no effect. On the doctor's visit, he found the tonsils greatly swollen and a false membrane covering them. He immediately administered small pieces of ice, and by the following morning the tumefaction of the tonsils had diminished by half, and the false membrane had nearly disappeared. That very evening she was enabled to take food. A few days afterwards, her brother was seized with a similar sore throat, when, profiting by the example, he took ice and was rid of it in a few hours.

Dr. De Grand was summoned, in another case, to a young lady who had been laboring under the disease for two days, and was evidently sinking in spite of all previous treatment. The parents, relations, and friends of the family were immersed in the deepest sorrow. The doctor ordered ice, a general cry of astonishment was uttered by all present. Ice for sore throat! Impossible! It would be sheer murder! He, however maintained his ground; and after much expostulation, during which precious time was lost, he otained his end. Before twenty-four hours the patient was in full convalescence.

Being at Vera Cruz on a mission, he was requested to see a young man who was attacked with malignant sore throat, and had been treated without effect by cauterizations with hydrochloric acid and astringent gargles. Here again he had to battle with the

prejudice of the family, but was at length allowed to administer ice. The young man recovered in the course of the following day. Dr. De Grand says, that although he has prescribed this remedy for the last twelve years, he has never yet met with a single failure after its adoption; he is evidently sincere in his opinion of its efficacy, and although it may not be as successful in other hands it certainly deserves a trial. Cold gargles have been recommended by Dr. Blane of Strasburg—Why not employ ice?

—[*Med. and Surg. Reporter.* *Dr. W. N. Cotě,*

Peritoneal Sections.—In perusing the account of another formidable operation, the removal of a large abdominal tumor with attachments to the lumbar vertebræ, uterus, &c., performed by Dr. O'Reilly of New-York, one cannot but remark that, taking advantage of the æsthenic character of all diseases of the present age, step by step, are surgeons everywhere drifting as it were into the knowledge of the impunity with which the serous cavities of the human body may be assailed. And it cannot be long before some one of them, yet a little more venturesome, will prove that peritoneal section for obstructions of the bowels, gall duct, œsophagus, &c., may be performed with success; and that lives now so often sacrificed from them, may frequently by its means be preserved.

It is not long since it was our painful duty to make a couple of post mortem examinations for intus-susception, when we were led seriously to reflect that should other occasions arise, even a forlorn hope would tempt *our* prudent hands to cut into the abdominal cavity before death.

Nor can we pass over this case or those of Prof. Byford of Chicago, without noticing the constantly increasing evidence of the power of large doses of opium in controlling the after inflammation otherwise attendant on such operations. Two grains of solid opium at once—two grains more in half an hour, and two grains every three hours, or a grain every hour and a quarter all night long, with a quick pulse, continuing it for a week every three hours, is indeed heroic; but experience tells us that the life of the patient can thus be saved, and so we grow wiser by each success in this, another of the important legacies of Graves.

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THERE has existed considerable doubt among physicians as to their liability under the Internal Revenue Law to a tax on their incomes. The Commissioner has made several decisions. The following extracts embrace the principal points:

"It is asked whether an assessment for Income Tax is to be made upon collections during the year 1862, for professional services rendered during that year and previous years, and whether an estimate of unrealized, or contingent income due for services rendered in that year ought to be included? I answer, that the assessment should be made upon all collections during the year 1862, without regard to whether the services were rendered during that or previous years. If any profits made during that year and uncollected, remain uncollected when they might have been readily realized, and with a view merely to avoid the assessment of the tax, they are to be considered as collected, and assessed accordingly; for no evasion of the liability of the tax-payer of his duty under the law should be allowed to profit him. But merely contingent profits, uncollected, the sum not ascertained, remaining open for adjustment, are not liable to assessment.

"2d. As to 'expenses necessarily incurred in carrying on any trade, business, or profession,' physicians cannot be allowed the wear and tear of horses, carriages and harness, any more than they can of their own constitutions, or of their health, necessarily injured in the practice of their vocation; but any incidental expenses, such as the feeding of horses, hire of servants, and such like, are to be deducted from their income.

"The amount expended by a physician for the keeping of a horse used exclusively in the business of his profession, is a legitimate deduction from his income."

Combination of Protiodide of Iron and Manna—The protiodide of iron, in the form of pills, is very commonly employed in France, and the preparation generally contains the protiodide with a certain proportion of honey powdered liquorice, and powdered mallow. M. Fouchier recommends a kind of sugar-plum (*dragée*) composed of protiodide of iron, purified manna in tears, and powdered liquorice and mallow. By the union of these substances, M. Fouchier obtains a mass in which the combination of manna with the proti-

odide preserves the latter from any alteration, and it forms a true paste, which, when divided into pills or *dragées*, soften, by the heat of the hand. Each *dragée* broken into pieces presents internally the greenish color characteristic of the well-prepared and well-preserved potosalt of iron. In this preparation, therefore, there are two essential conditions observed—namely, the preservation of the salt without chemical alteration, and its easy solubility in the digestive passages. But M. Fouchier also believes that the manna, by its laxative operation and its stimulating the secretions of the digestive canal, but would also act both in facilitating the absorption of the drug and preventing the tendency to constipation which is one of the most troublesome effects of the ferruginious preparations.—*London Pharm. Jour., Sept.*, 1863.

The Ventilation of Ships.—A plan of ventilation, invented and patented by Dr. Edmonds, Staff-Surgeon of the *Victory*, is to be tested in the turret-ship *Royal Sovereign*, at present in course of construction at Portsmouth. Dr. Edmonds's proposed system is self-acting, and it professes—

Not only to furnish an ample supply of pure fresh air to the crew, but also to effect the very important object of preserving the ship's timbers from decay or dry rot, by creating a constant circulation of air throughout the framework of the ship. This is effected by converting the timber spaces from the keel upward, between the "ribs," so to speak, of the ship, into draught channels leading into a tunnel shaft fore and aft on each side of the ship's berthing deck, which communicates by cross shaftings with the funnel, the draught of the funnel furnishing the motive power for the suction of a continuous current of air upwards through the ship's timbers, and carrying off the foul air and gasses from the ships hold and bilges without tainting the air the crew breathe on the berth deck.—*Med. Times and Gazette.*

Cholera at Bombay.—A sharp visitation of cholera in Bombay has carried off several Europeans, but the scourge has now disappeared.—*Lancet.*

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Gluten in Crust of Bread.—M. Barral has presented to the Academy of Sciences some remarks of much interest concerning the crust of bread and the gluten contained in it. He had recently shown that, when equally dried, the crust of bread is more highly azotized than the crumb; and he also showed that the crust was more soluble than the crumb in water. M. Payen had, it is true, previously pointed out this greater solubility of the crust, and had ascribed it to the conversion of the starch into dextrine during the baking. But M. Barral's experiments show another important fact. "If," he says, "we exhaust with water an equal quantity of dry crust and dry crumb of bread, we find that the soluble portion of the crust consists of from seven to eight per cent. of nitrogen, whilst the soluble portion of the crumb contains only from two to three per cent. The greater solubility of the crust consequently, depends upon the transformation which its gluten has undergone under the direct action of the 200° to 220° heat of the oven The soluble portion of the crust is more highly azotized than the juice of meat." M. Barral added that he was still engaged with his experiments, which would throw some new light on panification.—*Amer. Jour. Med. Sci. Oct.* 1863.

Vermillion Rock Salt Mine at Petite Anse, Louisiana.—One of the facts of scientific interest brought to light by the Southern rebellion is the discovery of an important deposit of rock salt of remarkable purity in the island of Petite Anse, in Vermillion Bay, on the Gulf coast of Louisiana. By the kindness of Mr. Geo. D. Colburn, a large specimen of this salt has reached us. Its analysis by Dr. J. L. Riddell, of New Orleans, gives the following composition: Chloride of sodium 98.88, sulphate of lime 0.76, chloride of magnesium 0.23, chloride of calcium 0.13,=100. This analysis, it will be seen, makes the Petite Anse salt almost pure.

Salt springs had been known on the island from an early period, but no suspicion existed of there being rock salt near the surface, until the late owner, Judge Avery, with the view to improve the flow of water from one of the saline springs, caused an excavation to be made, when, at the moderate depth of only fourteen or fifteen feet from the surface, the laborers struck the bed of white rock salt, which they at first imagined must be ice. It was at once recog-

nized, and proved of incalculable advantage to the Confederates, as well as a source of great wealth to the owner. The Island of Petite Anse (Little Elbow Island), so named from its shape, is a body of very fertile land, supporting rich crops of sugar cane and corn, besides forrest trees, about 2½ miles long by 1½ wide and containing about 2100 acres. It rises 170 feet above tide in the midst of a wide spreading marine swamp. The soil of the island is an umber-colored argillaceous sandy loam, capable of forming good bricks.

The salt is covered by a whitish, cream-colored solid smooth rock, at an average depth of about 19½ feet below the surface or 4½ feet below tide water. There is no moisture or brine in the deposit, the salt being compact, hard and perfectly dry. Our intelligent correspondent is not a geologist, nor does he send us any fossils with the salt. But the deposit is undoubtedly of the Tertiary age.—*Am. Jour. Sci. and Arts, Sept.* 1863.

The Wax Tree of Japan.—"On this remarkable plant, the *Rhus succedanea* of botanists, the 'Bulletin de la Société d'Acclimatation' publishes an interesting paper by Eugéne Simon, now at Nagasaki. The vegetable wax of Japan is one of the chief articles which that country exports. It is not exactly of the same nature as common wax, since it melts in summer at the common temperature; but this inconvenience is obviated in Japan by protecting the candles made with this wax by a coating of beeswax. It appears that in England a process has been discovered for increasing its consistency, since the demand for the article from that quarter has considerably increased of late. The tree itself might be easily acclimatized in the southern parts of France. It thrives on mountains and on stony and barren ground, unfit for other agricultural purposes. M. Simon has sent over about twenty kilogrammes of its seed for trial. The young trees are planted in Japan along the highways, when they are two years old, leaving a distance of about three feet between the stems; but if planted in squares, the distance must be double. The trees are kept low by lopping, and trimmed in the shape of pyramids. In the fifth year after planting, each tree yields on an average 4lb. of seeds; in the eighth year, 6lb.; in the 10th, 18lb.; in the 12th, 40lb.; in the 15th, 60lb.; in the 18th year the tree enters upon its decline; 400lb. of

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seed yield 100lb. of wax. At present 200lb. of this wax are sold in London at the price of £5; so that a plantation of 10,000 trees in their prime may produce £4,000. The seed is gathered toward the end of autumn, threshed, and then left to dry for a fortnight, after which it is slightly roasted. It is next crushed under a millstone, and the produce exposed to the heat of steam in canvas bags; the wax is then obtained by the action of a screw press This wax is of the third or lowest quality: to bleach it, it is rasped and rinsed in water, and then exposed to the action of the sun and dew for three days. A still higher quality is obtained by repeating this operation."—*Lond. Pharm. Jour. Sept.* 1863, from *The Times.*

Drunkenness in England has gradually risen into a most formidable social vice, as appears from the following statement in the *Lancet.*

"By a Parliamentary paper lately issued, it appears that in the year ending Michaelmas, 1861, there were 54,123 persons, male and female, convicted of drunkenness in England and Wales; but in the year ending Michaelmas, 1862, the number convicted reached the high amount of 63,250, whilst not less than 100,000 were proceeded against before justices of the peace for being in a state of inebriety. Thus the disheartening increase of more than 9000 intoxicated persons was proved to have occurred last year! The proportion of drunkards convicted to those taken up did not alter, being in each year about 66 per cent. of those charged with this offense to our national character."

Tannin in Conjunctivitis and Strumous Ophthalmia.—Dr. G. R. Sherarton finds a solution of tannin more successful than any other application in these troublesome eye affections. He adds from one to two drams to each ounce of water, and directs it to be dropped into the eyes several times a day. It causes much smarting and lachrymation, but this is soon succeeded by a feeling of comfort, and freedom from irritation. In cases of phlyctenular ophthalmia, or ulcers of the cornea, he conjoins atropine or ext. belladonna with it, and likewise preparations of opium when required.

Treatment of Chaps and Chilblains.—The *Bulletin Médicale du Nord de la France* registers the following formula, which M. Testelin has found useful in cases of chilblains uncomplicated by ulceration: Tincture of iodine, 3ij.; chlorinated solution of soda, 3vj. This liniment should be laid over the seat of the disease, and afterwards dried by exposure to the fire. M. Testelin states that the remedy effects a cure in three or four days. For the treatment of chapped hands the same practitioner has frequently resorted to the application of honey heated in an oven, and deprived of its viscidity by the removal of the froth formed under the influence of heat. It should be applied over the hands whenever they are washed, and spread with gentle friction. The author asserts that he has succeeded in curing chaps, and in preventing their return, in servant maids whose hands are frequently exposed to the contact of water, and who usually suffered from this inconvenient affection throughout the winter. He prescribed the same remedy with entire success in Brussels to a clear-starcher, although this person did not for a single day discontinue her employment.—*British Med. Jour.*. June 6, 1863.

Obscene Circulars.—Rascality seems to have manifested curious ingenuity in furtherance of the schemes of a so-termed American medical practitioner, who, calling himself a doctor, lives where those whom he addresses do congregate. A yellow bill, setting forth in most unmistakable terms that which he proposes to treat, has attached to it a small slip of adhesive paper, which enables it to be fastened to the backs of private carriages standing in the streets. This bill, printed in true sensation style, is headed "No cure, no pay," and appropriately, on the part of the alleged American physician, announces his overtures to the public.—*Lancet.*

New Reaction for Veratria.—Trapp, of St. Petersburg, has observed that the smallest traces of veratria dissolved in cold concentrated chlorhydric acid, giving a colorless solution, which, on continued boiling, assumes a red color that finally becomes very intense, and resembles that of permanganate of potash. The solution remains unaltered by standing for a long time.—*Am. Jour. Sci. and Arts, from Polytecnisches Notizblatt*, 1863, 96.

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On Impregnation.—Dr. F. J. W. Packham, in a letter to the London *Lancet* says, that conception occurring in women during the first half of the time between the menstrual periods, produces female offspring, and male in the latter half: that he has long been in the habit of informing those who are out in their reckoning of the time of their parturition, that the error has probably arisen "from an idle boy," and that he rarely fails in being right. He concludes by saying that all animals are governed by the same law—and that control through this kdowledge could, if desired, be exercised over the gender of their offspring.

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